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Abstracts of Poster Sessions

CELLULAR ALLERGEN STIMULATION TEST (CAST) : A NEW TEST FOR THE DETECTION OF ALLERGY IN CHILDREN WITH RESPIRATORY DISEASE? A. Tridon[1], J.L. Fauquert[2], V. Sapin[1] M. Maire[3], G. Bétail[1], A. Labbé[3]. [1]Laboratoire d'Immunologie, [2]Unité de Réanimation et des Maladies Respiratoires de l'Enfant, Clermont-Ed. 63003, [3]DPC/Behring, Rueil Malmaison, 92500, France.

CAST measures the production of leukotrienes following the stimulation of leukocytes by an allergen. We determined if this new test allowed the detection of allergic diathesis in children in comparison with standard allergic data. The study was carried out in 14 children (5 to 15 years of age), suffering from chronic respiratory disease (asthma, chronic cough). The blood sample was taken during standard allergic examination comprising: skin prick tests, measurement of total IgE, determination of specific IgE (Alastat DPC: Behring). Isolated blood leukocytes were incubated in a medium containing IL3 in the absence (basal response) or in the presence of stimulative agents (anti-IgE, ionomycin, polyvalent allergen containing 21 allergens). Measurement of the leukotrienes LTC4, D4, E4 before and after stimulations was done by immunoenzymatic technique. In 5 children, the basal response was above the limiting value of 280 pg/ml of leukotrienes and in 3 cases, exceeded 1000 pg/ml. There was significant correlation ($r=0.51$, <0.05) between these basal values and eosinophilia. Eight children did not present an increased leukotriene level following allergenic stimulation and both specific IgE detection and skin test were negative. Six had a positive CAST and 4 had significant specific IgE levels. This test seems effective in children with suspected allergy for whom the standard allergy tests are negative despite an evocative clinical context.

HOW TO ASSESS COW'S MILK ALLERGY WHEN CONFIRMED BY CLINICAL CHALLENGE? S. Allard, G. Casimir, J. Duchateau. Pulmonology and Allergy Department and Laboratory of Immunology, University Children's Hospital Queen Fabiola, Free University of Brussels ULB, Belgium.

Allergy to cow's milk (CM) is an important problem in pediatrics. In practice, sufficiently specific and sensitive tests, well correlated to the double-blind placebo controlled food challenge (DBPCFC), are not available: specific reagins (SR) are detected in serum (RAST) or skin only in about half of positive DBPCFC. The aim of this study was to evaluate the response of allergic children (AC) in terms of SR, but also basophil histamine release (BHR) and IgG response against betalactoglobulin (BLG), the major CM antigen. Twenty-eight children (gp 1), aged from 3.5 months to 12 years, with respiratory, cutaneous or digestive symptoms attributed to CM and confirmed by challenge were compared to a control group (gp 2, n=18) of asymptomatics (11 children, 7 adults). SR were detected (RAST) in 38% of gp 1 and 15% of gp 2 ($p<0.01$); skin prick test in 9.5% of gp 1 and in none of the control. Positive BHR was observed in 43% of gp 1 and 8% of gp 2 ($p<0.001$). Six patients had positive BHR while SR were not detected. This discrepancy could result from a poor sensibility in SR detection for very low titers of antibodies or involve another mechanism than IgE-mediated histamine release. Finally as already documented by our group, higher titers of specific IgG against BLG and also differences in epitope recognition were demonstrated in AC.

THE ROLE OF NEUROPEPTIDES IN CHILDHOOD ASTHMA. N.S. Lev, S.Y. Kaganov. Science Research Institute of Pediatrics and Child Surgery, Ministry of Public Health of Russian Federation, Moscow, Russia.

The neuropeptides, such as substance P (SP) and vasoactive intestinal peptide (VIP), may be neurotransmitters of the nonadrenergic and noncholinergic nervous system and thus be important in controlling human airway functions. We have measured neuropeptides by radioimmunoassay in plasma extracts of asthmatic children. Significant increases in plasma SP-like immunoreactivity levels was found in patients with an acute period of asthma. There was a correlation between the high levels for SP and clinical signs of inflammation in bronchi. SP is capable of modulating inflammatory responses and is a possible endogenous bronchoconstrictor. On the contrary, VIP-like immunoreactivity was significantly decreased in acute asthma. Acute period of asthma is characterized by an increase in the level of beta-endorphin. An improvement in the patients' condition, with absence of asthma attacks, was accompanied by a decrease in the levels of SP, beta-endorphin, and an increase in levels of VIP. These data reveal that neuropeptides may have a pathogenic role in childhood asthma.

CALCIUM-DEPENDENT REGULATION IN CHILDREN DURING A BRONCHIAL ASTHMA ATTACK. T.V. Bershowa, M.I. Bakanov. Institute of Pediatrics, RAMS, Moscow.

The content of ionized calcium (Ca^{2+}), calmodulin (CM) and cyclonucleotides (CN) in leukocytes was studied in children during a fit of bronchial atopic asthma (ABA). The dependence of the changes of these parameters upon the duration of the asthmatic fit and the status of the cardiovascular system were evaluated. Pronounced dissociation of CN content shows the prevalence of cholinergic processes which can be dependent also on the changes of the CM and Ca^{2+} content. The increase in intracellular Ca^{2+} levels is possibly connected with its intensified entrance into cell « targets », the latter fact is promoted by the discovery of increased cyclic guanosine monophosphate concentration in ABA children. At the same time, the increase in cyclic adenosine monophosphate limits the exit of the cation out of the cell. Ca^{2+} storage comes with enhancement of the cell. Ca^{2+} storage enhances cell contact with contractile proteins and to bronchospasms. The increase in the CM level has a protective character, aimed at enhancing the intensity of the adrenoreactivity. In ABA children, the finding of interactive changes in the CM-Ca^{2+} system with the degree of diminished contractility of the myocardium is defined by the sequence of neuro-humoral, cellular and molecular changes which lead to a disturbance of such physiological mechanisms as coordination of excitation-contraction and relaxation-contraction of the myocardium.

SOLUBLE HLA IN PATIENTS WITH BRONCHIAL ASTHMA. N.C. Jolia[2], F.B. Gelder[1], I.M. Adamashvili[1], J.C. McDonald[1]. [1]Louisiana State University Medical Center, Department of Surgery, Shreveport, LA, 71130; [2]Medical University, Department of Pediatrics, Tbilisi, Georgia, 380012.

HLA Class I and Class II antigens of the Major Histocompatibility Complex (MHC) are on the surface of most nucleated cells. However, the present studies demonstrate that HLA molecules can also be identified in a soluble form and that such soluble HLA-I (S-HLA-I) and soluble HLA-II (S-HLA-II) antigens may play a role in immunomodulation. To analyze the possible genetic relationship between S-HLA-I and S-HLA-II levels with MHC alleles in bronchial asthma, we used a sensitive solid-phase enzyme-linked immunoassay to measure S-HLA-I and S-HLA-II levels in 21 Georgian patients with bronchial asthma and 50 healthy Georgian individuals with known HLA-phenotype. HLA-A9 subjects (bronchial asthma and controls) had significantly higher levels of serum-HLA-I when compared to normal or disease- state individuals with other HLA-A antigens. There was no significant association of HLA-DR specificities with high or low levels of S-HLA-II molecules in patients or in normal controls. However, patients with active disease (n=11) had higher concentrations of S-HLA-II than those with the remission ($p<0.01$). Our findings suggest a possible role of S-HLA in the pathophysiology of bronchial asthma and there is an association between either augmented release or production of S-HLA-I and specific HLA allotypes.

IMMUNE-GENETIC MARKERS OF ATOPIC ASTHMA IN CHILDREN. A.E. Bogorad, I.E. Pospelov, V.V. Malynovskaya, E.N. Meshkova, N.A. Izachic, S.Yu. Kaganov. Science Research Institute of Pediatrics and Child Surgery, Ministry of Public Health of Russian Federation, Moscow, Russia.

Atopic asthma tends to run in families, suggesting a genetic component of asthma. Human leukocyte antigen (HLA) genes are involved in determining specific immune responses. We used the serologic method to identify the HLA-class I genes; for HLA-DR genes, DNA-typing was applied using PCR-SSP. We studied HLA haplotypes within a family, where 5 of 10 children were asthmatics; their father and grandfather were asthmatics as well, their grandmother (of the mother's line) had exema. Diagnosis of atopic asthma in children was based on acute episodes of wheezing and cough, increased levels of serum IgE, specific IgE antibody to common allergens. All members of the family had a low level of α- and γ-IFN. Genotyping data demonstrated that all asthmatic children had the same HLA-haplotype A1.B8.DRB1.0301 (received from their mother); three of them were haploidentical (two others, monozygotic twins, were haploidentical too). Such a distribution of HLA haplotypes among the patients suggests a linkage between the disease and this haplotype. The same HLA haplotype was found in three healthy members (mother and two children). But the clinical and immunological findings of these family members demonstrate a low peak expiratory flow rate, an increased serum IgE level, the presence of specific IgE

to inhalant allergens. These data raise the possibility of the development of atopic asthma in these family members. The results obtained show not only the diagnostic but also the prognostic role of the marker HLA A1.B8.DRB1.0301.

STRUCTURAL-CYTOCHEMICAL RESEARCH OF BLOOD MONOCYTES IN ATOPIC ASTHMA CASES IN CHILDREN. V.M. Vachnadze, V.T. Churadze. 5 Melikishvili, 380079 Republic of Georgia, Tbilisi Pediatric Institute.

The macrophages and their circulating equivalents -monocytes- play a special role in the pathogenesis of bronchial asthma. The monocytic-macrophagial system is important for homeostasis of the organism. A total of 80 patients with atopic asthma were examined. There were divided into two (I: 3-11 years old, I: 11-16 years old) groups. Morphological and cytochemical studies of monocytes of peripheral blood were performed in acute period of illness - before and after treatment. Material was examined with the use of light, luminescent and interference-polarizing microscopes. The observations in both groups showed that monocytes presented differently before and after treatment and during the remission period. There were serious structural changes of monocytes before treatment, mainly in the nucleus. These included: chromatin redistribution and size, perinuclear oreola, nuclear and cytoplasmic correlation, dry weight per unit surface, cell thickness and amplitude of light wave passing through the cell nucleus; and from a metabolic point of view, DNA polymerization and distribution of granules on nuclear surface. Therapy with symphatomimetics, bronchospasmolitics or hormones, did not restore the entire structural-cytochemical picture. Therefore, in both groups, we observed structural-cytochemical changes of monocytes after ZADITEN administration during the period of remission. ZADITEN mainly affected the nucleus, improved nuclear and cytoplasm correlation, increased euchromatin content and accordingly decreased heterochromatin size and content, but did not provide whole conformity with control data. Conclusion: The structural and cytochemical indices of monocyte change and according to this data, we can judge the severity of the disease, the efficiency of treatment and the ability for disease prognosis.

BRONCHIAL OBSTRUCTION PATHOGENESIS IN ACUTE RESPIRATORY - VIRAL INFECTIONS (ARVI) IN INFANTS. N. Manjavidze, L. Beitrishvili, E. Jafaridze, K. Nemsadze. State Medical University, Tbilisi, Republic of Georgia.

Recently Georgia has revealed an increase in ARVI incidents caused by RC-virus with the subsequent development of bronchial obstruction syndrome (BOS). Frequent cases of recurrent development of BOS in infants who had been ill with ARVI became the subject of a discussion on a possible transformation of this pathology into bronchial asthma (BA). The present study makes an attempt to reveal changes of immunological indices in infants with BOS (ARVI), characteristic for BA, in order to find in them similar changes in immune status (and indirectly in bronchi receptor apparatus as well) using lymphocytes as a model. In 27 patients aged from 3 mo. to 3 y. with BOS against the background of ARVI, we determined the levels of IgE, IgA, T and B-rosette-producing lymphocytes. Production from possible similar reactivity of T-lymphocytes and bronchi afferent structures to histamine, T-subpopulation by histamine sensitivity (THSC) were measured as well. We found a considerable increase in THSC in the acute stage of the disease in the group of infants without genetic or allergic burden in anamnesis which indicates the possibility of nonspecific viral agent effect on bronchi afferent structures with a transient development of their hypersensitivity. The preserved high level of THSC in recurrent diseases of BOS against the background of ARVI, a stable increase in IgE and IgA with a decrease in sIgA can be regarded as risk-factors of BOS transformation into BA which must be taken into account in treatment and observation.

TRANSFORMING GROWTH FACTOR BETA (TGF-β) IS INCREASED IN INTRINSIC ASTHMA. S. Zielen, V. Köberich, D. Reinhold[1], R. Kitz, P. Ahrens. Dept. of Pediatrics, J.W. Goethe-Universität, Frankfurt and Institute of Immunology[1], Magdeburg University, Germany.

Bronchial asthma has been characterized as a cellular inflammatory disorder in adult studies. To investigate the role of inflammatory cytokines in the lungs of children with asthma, we measured IL-6, IL-1RA, IL-2 and TGF-β concentrations in bronchoalveolar lavage fluid (BAL) from patients with asthma (n=15), healthy controls (n=16) and a group of patients with chronic bronchitis without bronchial obstruction (n=15). Age (median 5 years) and sex distribution of patients and controls were matched. All patients with and without asthma underwent bronchoscopy and BAL for failure of conventional therapy. BAL IL-6, IL-1RA, IL-2 and TGF-β concentrations (pg/ml) were higher in patients with asthma compared to healthy controls and patients without asthma. This difference was most impressive for TGF-β. In patients with asthma, TGF-β was median 2200 pg/ml, in controls 1000 pg/ml in patients with chronic bronchitis 1300 pg/ml ($p<0.01$). In addition to detecting the cell source responsible for the elevated TFG-β in asthmatics, we performed cell culture experiments. They showed a significantly lower in vitro production of TGF-β in patients with asthma compared to patients with recurrent respiratory infections ($p<0.01$), whereas IL-6 and IL-1RA production were unchanged. This suggests that TGF-β has been released in vivo by BAL macrophages in patients with asthma. Taken together, our data demonstrate that local cytokine production and especially TFG-β significantly contribute to the inflammatory activity in children with asthma. Given this information, early anti-inflammatory treatment is indicated in these patients.

TNFα$^+$ CELLS IN FATAL ASTHMA, MILD/MODERATE ASTHMA AND NON-ASTHMATIC CONTROLS. M. Synek, A.J. Frew, A. Shah, S.T. Holgate. York District Hospital, Wigginton Road, York, U.K.

TNFα is a potent fibrogenic cytokine produced by eosinophils and mast cells. To assess whether TNFα is upregulated in asthma, the number and distribution of TNFα$^+$ cells were studied in 12 fatal asthma cases, 7 subjects with mild/moderate asthma who died of unrelated causes and 7 non-asthmatic controls who died of various non-respiratory causes. Sections from formalin-fixed paraffin-embedded lung tissue blocks acquired at post-mortem were sectioned at 2μm and stained with mouse anti-human monoclonal antibody (mAb) directed against TNFα using the streptavidin-biotin peroxidase technique. Identically-processed sections with no antibody were used as negative controls. The size of the airways in terms of internal perimeter (Pi) and airway wall area (Wa) was measured using computer-assisted airway morphometry. The number of TNFα$^+$ cells in the epithelium of the fatal asthma cases was not significantly different from that in mild/moderate asthma. In the airway wall, the number of TNFα$^+$ cells was significantly greater in the fatal asthma group than in the group with mild/moderate asthma (46.8 vs 11.5 cells/mm^2, $p=0.004$). When the fatal asthma group was compared with non-asthmatic controls, cell counts in the epithelium were not significantly different. In the airway wall, fatal asthma cases showed significantly greater numbers of TNFα$^+$ cells than the non-asthmatic control group (46.8 vs. 3.00 cells/mm^2, $p=0.001$). We conclude that fatal asthma is associated with significantly increased numbers of TNFα$^+$ cells in the airway wall, but not in the epithelium when compared with mild/moderate asthma and non-asthmatic controls. TNFα immunostaining was distributed between mast cells and eosinophils. These findings suggest the role of TNFα in the pathogenesis of asthma and also the heterogeneity of asthma in terms of immunohistochemical findings.

SERUM ECP DOES PREDICT SUBSEQUENT WHEEZING AFTER BRONCHIOLITIS. T.M. Reijonen, M. Korppi, L. Kuikka and K. Remes. Department of Pediatrics, Kuopio University Hospital, Finland.

Objective : Follow-up studies have shown that up to 75% of infants with bronchiolitis suffer from subsequent wheezing. The aim of this study was to evaluate whether serum ECP can be used to predict subsequent wheezing after bronchiolitis. Patients: ECP values were measured from 92 infants (age range 1 to 23 months, mean 10.3 months) on admission as well as 6 and 16 weeks after hospitalization for acute bronchiolitis. Results: At entry, 14 of 92 (15%) had high (≥16μg/L) ECP levels. During the 16-week follow-up period, patients with ECP ≥ 16 at entry had significantly more doctor-diagnosed wheezing (12/14, 86% vs 34/78, 43%, $p=0.004$) and hospital admissions for wheezing (9/14, 64% vs 15/78, 19%, $p=0.001$) than the patients with ECP<16. Respectively, 25 (27%) patients had ECP ≥ 8μg/L; 76% of them had doctor diagnosed wheezing ($p=0.002$) and 48% hospital admissions for wheezing ($p=0.003$) during the 16-week follow-up. High ECP level was significantly associated with age over 12 months ($p<0.0001$), IgE 60 ($p<0.0001$), atopic dermatitis ($p<0.001$) and eosinophils ≥ 600 ($p<0.0001$). ECP values decreased in relation to time; at 6 weeks six children and at 16 weeks only one child had high ECP. Conclusions: An elevated serum ECP during bronchiolitis predicts subsequent wheezing after bronchiolitis. For this purpose, ECP is insensitive, but highly specific; specificity was 96% at the level ≥ 16μg/L and 87% at the level of ≥ 8μg/L.

INFANTS WHO DEVELOP ASTHMA HAVE LOW PULMONARY FUNCTION AND INTERFERON GAMMA PRODUCTION 5 MONTHS AFTER BRONCHIOLITIS. J.E. Marcotte, J. Turgeon, S. Spier, J.P. Yang, S.P. Drblik, P.M. Renzi, LC Simard and Ste-Justine Research Centers, Pulmonary Units. Ste-Justine and Notre-Dame Hospitals, University of Montreal and Meakins Christie Labs McGill University.

The objective of our study was to assess whether the cellular differential, lymphocyte subsets, cytokines and pulmonary function measured 5 months after acute bronchiolitis were different in infants who later went on to develop asthma. Seven ml of blood were obtained from 19 patients (7.3±0.6 mos. old), 4.7 mos. after bronchiolitis (B). Plasma was obtained for the measurement of interleukin (IL)-4 and interferon gamma (IFN) by ELISA. Lymphocytes were isolated by ficoll hypaque centrifugation and depletion of adherent cells, their surface markers were assessed for CD4, 8, 23 and 25 by immunochemical staining and the remaining cells were cultured for three days in medium alone or medium with IL-2 for the analysis of cytokine production. The maximal flow at FRC (Vmax FRC) and the PC40 histamine were measured by the squeeze technique. Two years following B, a group of 3 pediatric lung physicians classified the patients by the Delphi consensus method as No (n=7), possible (n=5) or probable (n=7) asthma. Results from all 3 groups were compared by analysis of variance (ANOVA), t test or the Mann Whitney test when comparing No to Possible and Probable asthma. Infants with probable asthma had or tended to have lower in vitro IFN production in response to IL-2 (147.3±45 vs 47.6±30 Ng/ml, No vs pos and prob, p=0.059), lower VmaxFRC (122±18 vs 77±7 vs 67±8% of predicted, No vs pos vs prob, p=0.004), lower PC40 histamine (6.4±3.3 vs 1.2±0.6 mg/ml, No vs pos and prob, p=0.01), lower CD4+ lymphocytes (56.6±1.4 vs 50±2.3%, No vs pos and prob, p=0.057), and higher blood eosinophils (0.217±0.04 vs 0.220±0.08 vs 0.386±0.026 million/ml, No vs pos vs prob, p=0.018). We found no difference in the age, family history of atopy, IL-4 and other lymphocyte subsets between all 3 groups. In summary, infants that go on to develop asthma have low in vitro IFN production in response to IL-2, high blood eosinophils, low VmaxFRC and low PC40 histamine 5 months after bronchiolitis. (Supported by the J.T. Costello Memorial Research fund, Inspiraplex and the QTS).

PSEUDO-ASTHMA IN THE INFANT AND CHILD (about six cases). B. Slaoui, F. Souhail, R. Chami, A. Aboussad, B. Bouharrou, F. Dehbi. Pédiatrie 2, Hôpital d'Enfants CH 1bn Rochd Casablanca.

The onset of asthmatiform dyspnea in an infant or young child is a common occurrence. If asthma is the most frequent cause, other etiologic factors must be considered. The authors report six cases of recurrent wheezing presenting as asthma in children aged from 12 months to 10 years. There were two cases of primary tuberculosis, two cases of intrabronchial foreign body, one case of vascular compression of the trachea and one case of rachitic lung. In each case, the initial diagnosis of asthma was revised on the basis of investigations performed either routinely or because of failure to respond to treatment. Emphasis is put on the need for a thorough work-up in pediatric patients with wheezing.

ASTHMA IN PEDIATRIC EMERGENCY IN LE HAVRE. P. Le Roux, P. Gatel, C. Morin, J. Boulloche, B. Le Luyer. Department of Pediatrics, CH - BP 24- 76083, Le Havre Cedex.

Methodology: We included all children coming into the emergency unit in our pediatric hospital in a prospective study. This study lasted 2 years, and for each child coming with the clinical diagnosis of asthma (paroxystic dyspnea crisis, spontaneously resolutive or with bronchodilators), the resident answered a few questions. Results: During this period, 416 children aged from 6 months to 6 years presented an acute asthma crisis, which represents 2.6% of children coming for medical disease. Among those 416 children, there were 267 boys, with a sex-ratio of 1.79. Age of children: 87.5% of the children were more than 2 years old: 32.5% between 2 and 5 years, 31.4% between 5 and 10 years, and 20.9% from 10 to 16 years. Asthma diagnosis is confirmed often after the age of 2 years. Hour of the crisis: 37.9% of children came from 6pm to 12pm, 26.4% from 12am to 18pm. The last 35.7% are equally shared from 12pm and 6am, and from 6am and 12am. Seasonal influence: we can establish a predominance of crisis from September to January; there is an increase in January (+52%) and a decrease during the summer (-30%). Severity of crisis: 63.3% of children came for moderate crisis, most of them (74%) were aged from 2 to 10 years. 36.7% came for severe crisis. Among the children under 2 years, the crisis was severe for 53.3%. The youngest children had the most severe crises ($p<0.01$). Reason of the emergency visit: 52% came without written reason; 23% came because they had an infection (54% were less than 5 years old), 14% came without long-term treatment (63% were less than 5 years old). The others came because they stopped their long-term treatment or because there were no practitioner to visit them. Anterior diagnosis: asthma diagnosis was well-known for 75.3% of the children (90% were older than 5 years). Among the 18 children coming for their 1st crisis, 17 were less than 5 years old. Treatment: 75.8% of children received a nebulized salbutamol (0.03 ml/kg, max 1 ml) and ipratropium bromide (0.25 mg); 6.5% received 2 nebulizations, and 17.7% did not receive any treatment, the crisis was spontaneously resolutive. Outcome of the children: 51.6% returned at home with treatment (72% between 2 and 10 years), 17% did not have any treatment (5% were less than 2 years old), 31.2% of children were admitted into the hospital (57% were less than 5 years old). The youngest children were admitted most often in the hospital ($p<0.005$). Conclusion: Infants had the most severe acute asthma and were often hospitalized. This study shows asthma is untreated and a better management at home is necessary in acute asthma.

ASTHMA HOSPITAL RATES IN KARAMANDANION CHILDREN'S HOSPITAL-PATRAS GREECE. A. Langussis, K. Panagiotopoulou, P. Preka, E. Mitsiou, C. Mitselos, N. Filias. Karamandanion Children's Hospital, Patras, Greece.

Hospitalization data plays a significant role regarding the prevalence, disease severity and patterns of medical practice for asthma. In order to study the hospitalization rates in the town of Patras, Western Greece, with a population of 200 000, we reviewed the medical records with the diagnosis of asthma in the Karamandanion Children's Hospital for the decade 1985-1994. This hospital is the one of the two pediatric hospitals which provide medical care for children in the town of Patras and the greater area and accepts emergency admissions during the year every other day. During the decade, 732 children were hospitalized with the diagnosis of asthma on discharge. Among them 30.2% female and 69.8% male. The number of admissions remained stable during the decade with the exception of the years 1989 and 1990 which were slightly lower. The average of hospitalization was 2.79 days and no significant change was observed during the decade. The above data could be explained as an indication that the prevalence of asthma remains stable in the area of Patras or that the medical practitioners in the area under-diagnose asthma.

PROGNOSIS FOR DEVELOPMENT OF BRONCHIAL ASTHMA IN CHILDREN: PROGNOSTIC CRITERIA FROM THE ANTENATAL PERIOD. S.N. Vakhrameeva. Institute of Pediatrics, Russian Academy of Medical Sciences, Moscow, Russia.

Considering broad chances of an early development of allergic diseases (AD) in children, including bronchial asthma (BA), an attempt was made to establish a prognostic algorithm based on social, inherited, biological and antenatal factors which, eventually, result in the development of BA in babies and children. To identify the level and effect of clinical and historical factors of a well-to-be mother on the future development of BA in children, we made use of a multiple step-be-step regressive research method. Records were made of 154 indices in 100 pregnant women with an allergic history and 100 indices for women without any previous allergic records. Out of the multitude of basic observed and recorded features, 6-7 features were identified as those possessing the highest informative value allowing a prognosis to be made. These features include inherited illnesses, frequent exacerbations of allergic diseases in pregnant women, chronic somatic and obstetrics and gynecology related diseases, occupational hazards, threat of miscarriage, high levels of total IgE and specific IgE antibodies in the blood serum of pregnant women with allergic diseases. The findings of the research have proved that a multitude of risk factors in a future mother's history (e.g. chronic diseases or complicated gestosis) will result in a higher risk/possibility of future allergy in her babies, including the risk of BA development. Thus, our prognostic algorithm makes it possible to make an antenatal forecast of BA development in babies to be born. The effectiveness of this method allows for a possibility of a timely diagnosis of pathological conditions in pregnant women, proper diagnosis and preventive treatment of patients.

EPIDEMIOLOGY OF ASTHMA IN THE REGION OF MAHDIA (TUNISIA). R. Boussoffara, M. Braham, A. Ayadi, H. Soua, Y. Belkhir, M.T. Sfar. Service de Pédiatrie, Hôpital Tahar Sfar de Mahdia, Tunisie, 5100 Mahdia.

Introduction: The prevalence of asthma is increasing in the world including between 6 and 10% of the children aged less than 15 years. Material and Methods : This survey was carried out in 2565 school children aged 5-15 years. A questionnaire was sent to the parents. Results: A group of 41 children with asthma was identified. The prevalence was 1.7%. The prevalence was higher in coastal parts of the region (2.5%) specially in the town of Mahdia (3.03%). We are going to focus on the importance of early diagnosis of asthma in different local district hospitals on the necessity of taking special care of this disease in its early stage which is not severe with the hope of reducing the morbidity and mortality due to this illness.

PREVALENCE OF CHILDHOOD ASTHMA IN ISTANBUL. Ü. Önes*, N. Sapan*, A. Somer*, R. Dişçi**, N. Güler*, I. Yalçin*, N. Salman*. *Istanbul Medical Faculty, Department of Pediatrics, Infectious Diseases, Clinical Immunology and Allergy, **Istanbul Medical Faculty, Department of Public Health and Statistics, Istanbul, Turkey.

In order to determine asthma prevalence in 6-12 year old school-children in Istanbul, we issued 2350 questionnaires delivered in 6 different regions of the city to be filled at home by the parents. 2232 of the questionnaires were returned completed with an overall response rate of 94.9%. 2216 questionnaires were taken into consideration. In the epidemiological definition of asthma, self-reporting of diagnosed asthma by a physician confirmation was used. 218 cases were diagnosed as asthma. The prevalence of asthma was found to be 9.8%. The risk factors which could be responsible for asthma, gender, smoking at home, presence of domestic animals (cat, dog, bird), stuffed toys, home dampness and breast feeding were evaluated. On the other hand socio-economic status (annual family income, education of mother and father, being owner or occupant of the house, heating system, total number of rooms in the house, large family, sharing of bedroom) were scored for each condition as 1 point for bad and 2 points for good conditions. In conclusion, the prevalence of childhood asthma was not affected by any of these factors. Atopic family history, food allergy, eczema, frequent otitis media and sinusitis attacks were evaluated and found to be significantly effective in asthma prevalence.

ALLERGEN SENSITIZATION OF ASTHMATIC AND NON ASTHMATIC SCHOOL CHILDREN IN COSTA RICA. M. Soto-Quiros, L. Belin, I. Gutierrez, N. Calvo, C. Araya, J. Karlberg, L.A. Hanson. Department of Pediatrics, Hospital Nacional de Niños, San José, Costa Rica.

Bronchial asthma is in many countries one of the most common chronic disorders, is a leading cause of childhood disability and due to the chronic character proper medical care becomes costly. Childhood asthma was found to be very common in Costa Rica, the prevalence of asthma in children between the ages of 5 and 17 years was based in terms of respiratory symptoms score using information from a questionnaire given to the parents (sample 2682). An asthma prevalence of 23.4% was found. Sex, age, urban/rural residency or different rain precipitation did not show any association with the diagnosis of asthma. Important identified risk factors were found: smokers in the home, high yearly average outside temperature (25°C) more than four upper respiratory infections during the preceding year. A group of children with and without asthma were randomly selected in order to establish the relation between asthma symptoms and allergy. Serum samples were analyzed for the presence of IgE antibodies to 36 different allergens, the presence of IgE antibodies to a pool of often different allergens (Phadiatop analysis) and for total IgE. The most prevalent IgE antibodies were to cottonwood/willow/aspen, mix, bahia, bermuda, rumex mix, sage mix, housedust mite, mite (D farinae), cat, dog, cockroach, alternaria, almond, egg white and garlic allergens. The positive reactions to the allergens housedust mite, mites (D farinae), cat, the two molds (Alternaria and Cladosporium), food allergens such as egg white, peanut and shellfish were more prevalent among asthmatics than non asthmatics. No differences in sensitization were found at different ages, but housedust, mite, cat, dog, cockroach, alternaria and egg white had sensitized males more often than females. The results of the analysis for Phadiatop showed positive results in 59.4% of the asthmatic children and 45.3% in the non asthmatic group, however other atopic diseases were found in 39% of the children in the non asthma group. The concentration of IgE was significantly higher among the asthmatic children. Our serological data indicate a very high prevalence of atopic sensitization to allergens.

ASSOCIATION OF ASTHMA AND ATOPY; A STUDY IN ASTHMATIC AND NON-ASTHMATIC SCHOOL CHILDREN SCREENED FROM A DEFINED POPULATION. S.T. Remes and M. Korppi. Department of Pediatrics, Kuopio University Hospital, Finland.

Asthma and other allergic diseases have become more common than earlier in children. The association of asthma and allergy in school-aged children has been evaluated in only a few population-based studies. We investigated the frequency of allergic disorders, the pattern of allergen sensitization and serum total IgE concentrations in a population-based sample of school children screened on the basis of respiratory symptoms (N=244)[1]. The children were classified on clinical grounds into three groups, asthma (N=47), OSLA (other symptoms from lower airways) (N=34) and control children (N=167). Allergic disorders (allergic rhinitis, allergic conjunctivitis or atopic dermatitis) were significantly more common in children with asthma (91%) and OSLA (85%) than in control children (62%) ($p<0.001$); allergic rhinitis was the most common manifestation. The presence of at least one positive skin prick test result was equally common in the children with asthma or OSLA (77%), but lower in control children (40%) ($p<0.001$). There was no significant difference in serum total IgE concentrations between the three groups. In addition, neither skin test reactivity nor current allergic disorders had any significant association with IgE. Two conclusions are justified : (1) there is a strong association between clinical allergy, skin reactivity and asthma in school children, and (2) a similar association is present between allergy and asthma-like conditions.

[1] ST Remes, M Korppi, K Remes, J Pekkanen. Prevalence of asthma at school age. A clinical population-based study in Eastern Finland. Acta Paediatr (in press).

EXPERT SYSTEM FOR DIAGNOSIS OF BRONCHIAL ASTHMA IN CHILDREN. L.V. Sukuluve, E.M. Furems, B.A. Kobrinsky, N.N. Rozinova. Science Research Institute of Pediatrics and Child Surgery. Ministry of Public Health of Russian Federation, Moscow, Russia.

Bronchial asthma is differentiated with a wide range of diseases. At present, bronchial asthma in children proceeds with some clinical and functional peculiarities. This results in a significant number of errors (according to various data - from 10 to 20%) in diagnosis and subsequent treatment of bronchial asthma. Application of an Expert Diagnostic System is a method to reduce the number of errors. The creation at our institute of an expert system DIFBA allows to effectively differentiate bronchial asthma with a number of diseases, accompanied by obstructive syndrome, on the basis of clinical, anamnesis and laboratory data. The Expert System has been developed on the basis of original environment STEPCLASS (Furems E, Gnedenko L, 1992) implemented on an IBM-compatible computer.

CORRELATION BETWEEN WHEEZY BRONCHITIS AND INFECTION BY CHLAMYDIA TRACHOMATIS OR CHLAMYDIA PNEUMONIAE IN CHILDREN. M. Bavastrelli*, D. Rossi* , M. Salzano*, M.T. Mascellino^, F. Iegri^, B. Angeletti° , M Midulla*°. * Pediatr Inst, ^Infect Dis Dept, "La Sapienza" University, and °CNR Inst Exper Med, Rome, Italy.

Aim of the study: to investigate the prevalence during 1994-1995 of chlamydial infection in children admitted to hospital with symptoms of wheezy bronchitis. Methods: 80 children, 57 boys, aged from 4 months to 14 years, mean age 38 months, were investigated. All children were negative on allergic evaluation and did not respond to bronchodilator agents. Pharyngeal and conjunctival swabs were tested for Chlamydia trachomatis by McCoy culture (MCM) and by direct immunofluorescence with monoclonal antibody (DAF). Chlamydia pneumoniae was searched by polymerase chain reaction (PCR), according to Campbell LA et al. Serological testing was performed using the micro-immunofluorescence technique (MIF) of Wang SP et al. for IgG and IgM. Results: C trachomatis was identified in 24/80 (30%) children in the pharynx and also in the conjunctiva in 21/80 (26.2%). C pneumoniae was present in the pharynx of 7/23 (30.4%). None of the children presented IgG and IgM antibody levels considered to be diagnostic of infection by C trachomatis; IgG to C pneumoniae ≥ 1:64 were present in 6/59 (10.1%) but IgM to C pneumoniae were negative in all patients. All infected children were treated orally with a macrolide and the wheezing gradually disappeared. Conclusions: although, in our children, serological methods were quite insensitive and have failed to detect antibodies against C trachomatis, however MCM, DAF and PCR were more reliable for a prompt diagnosis of chlamydial infection. We suggest that C trachomatis and C pneumoniae should be sought as routine in asthmatic children. Supported by grant 9103613 from CNR P.F. FATMA.

SURVEY OF ASTHMA IN FINISTERE: INTEREST OF BRONCHIAL OBSTRUCTION DETECTION AT SCHOOL. M. Bellet*, N. Kervern**, D. Sarni*, E. Dergeux*, J. Ferec**, F. Seznec**, J.J. Larzul***. *Unité d'Explorations Fonctionnelles Respiratoires, CHU, BREST, **Service de Promotion de la Santé en faveur des Élèves, Département du Finistère. ***Comité Finistérien contre les Maladies Respiratoires.

An initial study concerning children attending school between seven and eight years old (CEI form) was conducted in the city of Brest in 90-91. The present study is an extension of this preliminary work to the entire Department of Finistere. This survey concerns a population of 8683 children. The questionnaires were focused on respiratory symptoms, medical follow-up and atopy treatment and were distributed by teachers and doctors of the National Education Health Service in 92-93. The answer ratio reached 90%. Only questionnaires from children with asthma, wheezing, or asthma equivalent were analyzed, i.e. 1360 questionnaires (17%): the prevalence rate of diagnosed asthma was 5.8% for the Finistere Department and reached 7.5% for the city of Brest. These results are underestimated when questionnaires and studies of lung function are seen. When a child was kept in our study, a flow volume loop test was offered to him and performed at school by the National Health Education Service with portable spirographer for either asthmatic children or non asthmatic. 30% of them had at least a peripheral obstructive trouble in a period without any asthma crisis and were asked to see a specialized medicinal doctor (lung or atopic specialists). This survey (questionnaire and respiratory tests) contributes to the best treatment of children suffering from asthma and participates in preserving lung function of these children and can help to discover non-diagnosed asthma. We thank Le Comité Finistérien contre les Maladies Respiratoires and CPMA of North Finistere for their participation.

PREVALENCE OF ASTHMA AND ALLERGIC DISEASES IN ALGIERS SCHOOL CHILDREN. A. Bezzaoucha, R. Slimani, L. Yahyia-Ouahmed. Service d'Épidémiologie-CHU de Bab Le Oued Bd, Saïd Touati-Alger-Algérie.

A cross-sectional study was carried out in Algiers during the winter 1994 to determine prevalence of symptoms suggestive of asthma and allergic diseases among school children (1694), aged 11-17 years, using the International Study of Asthma and Allergies in Childhood protocol. The reported prevalence of a history of asthma was 6,4%, 8,4% for boys and 4,8% for girls ($p<0.01$). The cumulative prevalence of wheezing was higher: 15,3%. Sex and age did not show any association with wheezing. In the past 12 months, 9,1% of children had wheezed, 7,4% had attacks and 3,8% had limited speech. If wheezing during exercise and dry nocturnal cough were also considered as symptoms of asthma, the prevalence of asthma in the past 12 months would rise to 10,9%. Annual prevalence of rhinitis was 39,0%. Accompanied by itchy-watery eyes, the prevalence fell to 19,4%. Annual prevalence of atopic dermatitis, considering flexural involvement, was 5,7%. Algiers seems to be a middle endemy zone as far as asthma and allergic diseases are concerned.

ENVIRONMENT AND ASTHMATIC CHILDREN. T. Bquhadiba*, F.F. Boughrassa**. Unités d'hémobiologie** et de pneumologie* CHU, Oran(Algérie).

Despite advances in the understanding of the pathogenic mechanisms, clinical assessment and medical treatment of asthma, an increase has been observed in mortality and morbidity. A number of factors play a key role in this observation. One of these factors is the environment. Our epidemiological observations, in Oran (Algerian west area) confirm the responsibility of this factor. We noted an increase (to 40%) of hospitalizations for asthma in the period between 1980-1990, than the previous decade, with 5 times in children aged under 15 years. The aim of this study has led to the demonstration of a causative association between the degradation of the environment and the increase of asthma in children.

SENSITIZATION TO INDUSTRIAL CHEMICAL ALLERGENS IN CHILDREN WITH BRONCHIAL ASTHMA. Yu.L. Mizernitski, L.A. Duyeva. Research Institute of Pediatrics and Child Surgery of the Russian Federal Ministry of Public Health, Research Institute of Occupational Medicine, Russian Academy of Medical Sciences, Moscow, Russia.

In order to prove the contribution of industrial allergens to sensibilization in children, we examined 41 patients with bronchial asthma of various severity. The majority of children lived in ecologically unfavorable regions. Sensibilization to environmental chromium, nickel, and formaldehyde was detected by a highly sensitive specific variant of the complement fixation test. Sensibilization to both non-infectious and industrial chemical allergens was revealed in children with atopic asthma. A high titer of antihaptene antibodies in combination with increased levels of total IgE was the criterion of pathogenetic significance of such sensibilization. A clear-cut elimination effect was observed; relatively rapid decline in clinical symptoms during inpatient treatment in the pulmonology department. Competitive suppression of sensibilization to industrial chemical allergens by other more active antigens was characteristic of the majority of patients with grave asthma. We may conclude that by sensitizing the organisms, industrial chemical allergens make a contribution to the formation of chronic allergic broncho-pulmonary diseases.

CLINICAL FEATURES OF THE CHRONIC NON-SPECIFIC LUNG DISEASE (CNLD) AMONG THE ADOLESCENTS OF UZBEKISTAN. A.M..Ubaydllaev, Sh.U. Ismailov. Phtysiology and Pulmonology Research Institute, Tashkent, Republic of Uzbekistan.

After analysis of mass pneumological (4200 persons) and hospital (230 persons) investigation of adolescent data, a slight subjective and objective symptoms of CNLD and to a lesser degree (2 times) the frequency of acute attack of disease and having less information about the traditional common methods of investigation has been revealed, comparatively to that in adults. In unfavorable living zones (cotton-graving regions and the area surrounding the Aral Sea) and also in adolescents working at the tobacco factories, the development of lung pathology is characterized by more frequent acute attacks of CNLD on the background of an immune deficit and the availability of inflammatory - sclerotic changes in bronchial tubes, which leads to faster development of the process, in contrast to the inhabitants of Tashkent city and the sheep-breeding regions. The immune violation, revealed during the acute attack of CNLD in adolescents, is characterized by some special features in comparison with adults and expresses itself through a suppressed amount of B-lymphocytes, phagocytic activity of neutrophils and also in the intensification of immunoglobulin G production.

PASSIVE TABAGISM AND RESPIRATORY INFECTION IN CHILDREN. F. Dehbi, A. Abid, J. Najib, A. Zineddine. Pédiatrie 2, Hôpital d'Enfants, CH Ibn Rochd, Casablanca.

The authors performed an investigation on 143 households of 300 children aged less than 10 years divided into 2 groups of 150 children, one with passive tabagism and the other without passive tabagism. The investigation which lasted 3 months was realized according to the method of individual interview based on a pre-established filled questionnaire. The objective of this study was to determine the influence of passive tabagism on the incidence of acute respiratory infections, ORL infections and recurring respiratory infections. Tabagism was found in 69 households which contained 92 smokers and 150 children. The father was responsible in 75% followed by relatives who live in the same household in 23,9%. The mother was implicated only in one household. The average daily consumption of cigarettes by a household was 21,45 ± 0,67. Comparative statistical analysis between the two populations of children with or without passive tabagism show that tabagism increases, in a significant manner, the annual frequency of cough (78,7%) as well as its duration, the incidence of respiratory trouble (38,7%), wheezing (19,3%), nasal discharge (91,3%), the number of angina (45,3%) and febrile bronchitis (36,7%). The genesis of these disturbances is related to the precocity of the age of exposure of the children to passive tabagism, the duration of exposure and the daily number of cigarettes consumed by the household as well as the type of habitation and the characteristics of the bedroom. The authors insist on the misdeeds of passive tabagism and the necessity to fight against this flail. This is based on the information and the education of the patients who are the essential pillars for an adequate prevention.

COCKROACH ALLERGY IN 100 MOROCCAN ASTHMATIC CHILDREN. R. Chami, K. Zahiri, E. Souhail, K. Zrikem, B. Slaoui, F. Dehri. Pédiatrie 2 Hôpital d'Enfants, CH Ibn Rochd, Casablanca.

Cockroach is considered as a major allergen of house dust, and its involvement in allergic reaction is now established. This study reports the rate of cockroach sensitization in 100 new cases of asthma examined at pediatric consultation of allergy. This rate was compared to a group of 100 non-allergic children. The cutaneous tests were positive in 42 children, versus only in the

second group. The mean age was 6 ± 3,5 years (2 to 12 years). The socio-economic level was very low in 26 cases. 34 children lived in old and/or overcrowded houses. All the children sensitized to cockroach were in contact with it. Cutaneous sensitization to cockroach is in the fourth position after other pneumoallergens (house dust and acaris) and it is frequently associated with them. Mono sensibilization to cockroach was found in only one case. The great frequency of cockroach allergy must allow its systematic research in allergic children. The treatment is difficult because of the difficulties of eviction, so specific immunotherapy may be interesting.

INDOOR AIR POLLUTION IN EAST GEORGIA. M.A. Gotua, M.J. Chamorro*, A.G. Gamkrelidze. Department of Allergology, Medical University, Tbilisi, Republic of Georgia, *Alergia e Inmunologia Abello S.A., Madrid, Spain.

Determination of indoor allergens in different geographical areas and investigation of their role in sensitization and development of allergy is an actual problem of modern allergology. The purpose of the study was to analyze the content of major mite (Der pI, Der fI, Der II) and cat (Fel dI), allergens in 39 house dust samples of allergic patients by DEA test of the firm "Alergia e Inmunologia Abello S.A." in East Georgia, where the climate is dry continental and the altitude is approx. 400m above sea level. Collection of samples was performed at spring. The highest concentrations recorded for Der pI, Der fI, Der II and Fel dI exceeded 25,00 mcg/g, 77,00 mcg/g, 24,00 mcg/g and 6,00 mcg/g of dust respectively. Elevation of concentrations of indoor allergens (>2 and 10mcg/g) correlated with increased frequency of combination of house asthma with rhinitis in comparison with asthmatic patients without. Polysensitization to various allergens (mite, mold, pollen, etc.) was significantly often found in patients who had elevated concentrations of indoor allergens (>2 and especially 10mcg/g) in house dust samples. Influence of age of the house on the content of indoor allergens in dust samples was not revealed. Prevalence of Der.farinae exceeded 4 times more that of Der.pte ronyssinus; this should be considered for preventive measures and immunotherapy of house dust allergy in children in this region. Obtained data indicate the importance to continue the determination of the content of major indoor allergens in dust samples in West Georgia where humidity is high, the climate is subtropical and prevalence of atopic diseases is high.

PARTIAL LIQUID VENTILATION SHOWED ONLY TRANSIENT EFFECTS IN RABBIT MODEL OF MECONIUM ASPIRATION SYNDROME. M. Tamura, T. Nakamura, J. Baba, T. Yoda, E. Shimazaki, T. Yamazaki, S. Iwata, M. Ushikubo, S. Kim and H. Adachi. Nagano Children's Hospital, 3100 Toyoshina-chou, Nagano-ken, Japan.

Introduction: We evaluated the effect of perfluorocarbon-associated gas exchange in the rabbit model of meconium aspiration syndrome (MAS). By this technique, we expected the lavage of meconium from the tracheobronchial tree as well as uniform ventilation and perfusion. Method: Six adult white rabbits were tracheotomized and put on Humming II. After the instillation of 5ml/kg of 20% human meconium, animals were ventilated with CMV mode (F_IO_2=1.0, pressure = 25/2cmH_2O, mean airway pressure (MAP)=10cmH_2O, rate-20/min.). After evaluating the severity of the respiratory distress by the arterial blood gas sample, Fluorinert FC84(FC84:C_7F_{16}) was instillated into the trachea (loading dose: total 15ml/kg divided into three aliquots, maintenance dose: 5ml/kg/hour). The ECG, arterial blood pressure, CVP, body temperature, airway pressure and the movement of thorax were monitored continuously, and arterial blood gas analysis and tidal volume were measured repeatedly. After four hours of mechanical ventilation, animals were sacrificed and the lungs were removed for pathological studies. In one animal, a chest x-ray film and a CT-scan of the chest were taken. Results: By instillation of FC-84, the PaO_2 improved significantly from 60.3 ± 22.9mmHg to 142.8 ± 84.1mmHg, which decreased to 53.7 ± 13.4mmHg at one hour after the onset of PLV. While $PaCO_2$ decreased slightly from 55.9 ± 16.9mmHg to 52.0 ± 18.7mmHg by instillation of FC-84, hypercarbia deteriorated again at one hour after the onset of PLV. Four rabbits developed pneumothorax. Histological study showed plugs of meconium in the trachea. Conclusions: The perfluorocarbon-associated gas exchange showed only transient effects of improvement of oxygenation and CO_2 elimination in rabbit model of MAS. The removal of meconium plug from the trachea was necessary to maintain the effects of PLV in this model of lung disease.

RELATIONSHIP BETWEEN RECURRENT BRONCHITIS AND ATOPIC DERMATITIS IN CHILDREN DEPENDING ON ECOLOGICAL CONDITIONS. N. Dorokhova, V. Tatochenko, V. Reutova, S. Shmakova. Institute of pediatrics, Kams Lomonosonsky pr 2/62, Moscow, Russia.

The purpose of our study was to investigate the effect of ecological factors on the course of recurrent bronchitis and atopic dermatitis in children. 98 children with recurrent bronchitis were examined, including three groups of children - residents of an ecologically clean urban area, environmentally polluted urban area and clear rural area (comprising 30, 35 and 32 children, respectively). In our study we used questionnaires for children and parents, medical data, results of skin tests, and lung function tests. The results of the study indicate that the highest incidence of recurrent bronchitis combined with atopy (68% of cases) is observed in environmentally polluted area. Children in this group also showed positive skin test results and graver bronchial conduction disorders as compared with children without atopy. Conclusion: Children with atopy combined with recurrent bronchitis living in environmentally polluted areas show a high risk of developing bronchial asthma.

RESPIRATORY MORBIDITY AND MORTALITY IN PREMATURE NEWBORN INFANTS LESS THAN 1500 GRAMS. H. Guimarães, V. Costa, M. Mateus, C. D'Orey, A. Martins, G. Silva, A. Souto, N. Teixeita Santos. Hospital de S. João, Oporto, Portugal.

Scientific and technological advances in monitoring and treatment of premature newborn infants are the most important contributors to decrease morbidity and mortality in very low birth weight (VLBW) infants. However morbidity of the infants is yet a major problem in NICU. The aim of this study was to evaluate the respiratory morbidity and mortality in premature newborn infants less than 1500g admitted to our NICU. Material and Methods: We studied all premature newborns less than 1500 grams admitted to our NICU between January and December 1994. We excluded infants with congenital surgical and cardiac pathology. We considered 3 groups of patients according to gestational age (GA) Group I - GA < 31 weeks; Group II - GA 31 and 32 weeks and Group III > 32 and < 31 weeks, and we compared morbidity and mortality in 3 groups.

Results are shown in the table:

	Group I (n=16)	Group II (n=18)	Group III (n=15)
GA*	28±1 (26-30)	31±0,5 (31-32)	34± 1 (33-36)
BW*	1063±257 (685-1405)	1235±200 (800-1485)	1310±120 (1070-1480)
MV*	6±5 (1-17)	4±2 (1-8)	4±3 (1-10)
HMD n(%)	12 (75%)	12 (67%)	3 (20%)
BPD n(%)	6(37,1%)	2 (11%)	0
PDA n(%)	8(50%)	2 (11%)	3 (20%)
IVH (I-IV) n(%)	8(50%)	6 (55%)	1 (7%)
Sepsis n(%)	11(69%)	10 (55%)	5 (33%)
Resp. Mortality n(%)	2(12,5%)	0	0

* Data are in mean ±SD; BW: birth weight; GA: gestational age; MV: mechanical ventilation; HMD: hyaline membrane disease; BPD: bronchopulmonary dysplasia; PDA: patent ductus arteriosus; IVH: intraventricular hemorrhage.

We concluded that respiratory mortality and chronic respiratory sequelae account for an important percentage of cases in VLBW infants. These problems are more frequent and important in preterm infants less than 31 weeks of GA.

BRONCHOPULMONARY DISEASES IN CHILDREN OF 1-4 YEARS, TREATED WITH ARTIFICIAL VENTILATION IN NEONATAL PERIOD. G.M. Dementieva, T.B. Kuzmina, I.N. Chernonog, M.I. Frolova, L.S. Baleva. Research Institute for Pediatrics and Children's Surgery, Moscow, Russia.

Neonatal respiratory disorders, treated with artificial ventilation, may result in chronic respiratory diseases in older age. Objective: Determination of the incidence and types of broncho-pulmonary pathology in children of 1-4 years, treated with artificial ventilation in the neonatal period. Patients and Methods: Prospective study has been carried out over 108 survived infants, who had received positive-pressure ventilation (PPV) for respiratory distress syndrome (RDS) (48), meconium aspiration (42), central nervous system disturbances (17) in the neonatal period. Birth weights varied from 900 to 4,200 gm, gestational age - from 27 to 41 wks. Results: It was found that 39 (36%) out of 108 children suffered from chronic bronchopulmonary diseases. More frequently (16 out of 39 cases) these children had suffered from asthmatic bronchitis and bronchial asthma. 11 out of 39 infants at the moment of discharge from the hospital at the age of 1.5-3 months revealed clinical and radiographic symptoms of bronchopulmonary dysplasia (BPD). BPD was noticed to disappear in 7 out of 11 children by the age of 12 mo, while in 4 out of 11 children BPD remained. 8 out of 39 infants revealed a single episode of

bronchial obstruction and 6 cases revealed repeated pneumonia. Comparative analysis (X^2) of the groups with (39) and without (69) bronchopulmonary pathology showed more frequent potential factors in the first group, such as: birth weight ≤ 1,500 gm, RDS, caused by hyaline membrane disease, PPV ≥ 6 days, barotrauma and pneumonia in the neonatal period and lung disease in family history. Conclusions: 1. The frequency of chronic bronchopulmonary diseases in children or the first four years of age, treated with PPV in neonatal period, was 36%. 2. Allergic bronchopulmonary diseases were most frequent. 3. The formation of this pathology is in close link with birth weight, course of disease in neonatal period, PPV duration and family history.

BRONCHOPULMONARY DYSPLASIA : MORBIDITY AND MORTALITY IN A NEWBORN INTENSIVE CARE UNIT. H. Guimarães, M. Mateus, C. d'Orey, A. Martins, G. Silva, A. Souto, N. Teixeira Santos. Hospital S. João, Oporto, Portugal.

Bronchopulmonary dysplasia (BPD) has become by far the greatest contributor to morbidity in Newborn Intensive Care Units (NICU). The aim of this study was to evaluate morbidity and mortality due to BDP in our NICU. Between January 1992 and July 1995, we consecutively studied 20 patients (17 males and 3 females, with gestational age range of 25 to 32 weeks, x = 29, and a birth weight range of 600 to 1800 grams, x = 1200, with BDP according to Bancalari and Shennon criteria. Severe BPD was defined by oxygen dependence at 4th month of life. All patients were ventilated (conventional ventilation) immediately after birth due to respiratory distress syndrome (RDS) and received exogenous surfactant in the first twelve hours of life. Severe BDP was seen in two (10%) infants. Ten (50%) infants had intraventricular hemorrhage. 8 (40%) a patent ductus arteriosus, 10 (50%) a gastroesophageal reflux and 6 (30%) were under 10th centrile. Wheezing was present in 8 (40%) infants and rehospitalization during first year of life was necessary in 8 (40%). Mortality was 5% (one infant died with septicemia). We concluded that, in our NICU, BDP is yet a major problem concerning morbidity in spite of advances in treatment of neonatal RDS.

GENETIC FACTORS IN CHRONIC LUNG DISEASE IN NEONATES. PRELIMINARY RESULTS. H. Guimarães, P. Xavier, M. Mateus, C. d'Orey, A. Souto, N. Teixeira Santos, A. Mendes. Hospital S. João, Oporto, Portugal.

Chronic lung disease (CLD) in newborns has been associated with prematurity, mechanical ventilation and high inspired oxygen concentration. However only a small percentage of premature infants treated with mechanical ventilation and oxygen therapy develop chronic lung disease, with several grades of severity. This suggests that genetic factors predispose some prematures to develop CLD. The aim of this study was to determine the HLA types of premature infants with CLD and correlate those findings with the clinical course of these patients. Material and Methods: HLA phenotypes were determined on 17 newborn infants weighing less than 1500g and oxygen dependent at 36 weeks postconceptional age and on 2384 healthy controls. We carried out typing of 18 HLA-A and 32 HLA-B antigens by micro-lymphocytotoxic test. Results: The antigen B13 shows to have statistic significance after the correction p (X^2 = 11,29, p = 0,00078, pc = 0,025, Fisher's tests : p = 0,00078 and RR (Relative Risk) = 6,6. We concluded, with our preliminary results, that genetic factors (HLA types) seem to have some role on development of CLD in prematurity.

NON SPECIFIC PRESENTATION OF SARCOIDOSIS IN CHILDREN. F. Raymond*, C. Jolivet*, C. Gambert*, F. Millot**, F Gilhot**. *Dept. Pediatrics, **Dept. Hematology. University Hospital, Poitiers, France.

Sarcoidosis is a systemic granulomatous disease of unknown etiology. The clinical presentation is extremely variable depending on the organs affected by sarcoid infiltration. We report two unusual presentations of sarcoidosis mimicking hematological diseases. The first case is a girl for whom diagnosis of thrombocytopenic purpura was made at the age of 11. When she was 15, she complained of weight loss, asthenia, fever. The Mantoux test was negative. Ultrasound showed splenic nodules. A fine needle aspiration biopsy was performed and demonstrated non caseating granulomas. Diagnosis of sarcoidosis was confirmed although angiotensin converting enzyme (ACE) was in the normal range. The girl improved under corticosteroid therapy. Unfortunately splenectomy had to be performed to obtain lasting resolution of thrombocytopenia. The second case is a boy 9 years old admitted for asthenia, decreased blood cell count and marked hepatic and splenic enlargement. The diagnosis of sarcoidosis was supported by the finding of non caseating epithelioid granulomata in the bone marrow and in the transbronchial lung biopsy. The boy also had an anterior and posterior uveitis. ACE was elevated. He had answered well to corticosteroid therapy (1mg/kg/day prednisone) and recovered from his ocular manifestations; the hepatosplenomegaly decreased but moderate leukopenia and thrombocytopenia persisted. The mechanism involved in blood cell count decrease in patients with sarcoidosis is variable: either centrally related to bone marrow involvement, more often peripheral with increased destruction (hypersplenism). Thrombocytopenia, leukopenia and anemia (sometimes hemolytic) have been described associated with sarcoidosis. Previously published cases involve adults except for one child with sickle cell anemia. The association of thrombocytopenia with sarcoidosis is the most fully documented. Several observations suggest that these hematological abnormalities associated with sarcoidosis are mediated by immune mechanisms: non specific B cell activation may occasionally lead to production of antibodies to blood cell antigens.

IDIOPATHIC PULMONARY HEMOSIDEROSIS IN TURKISH CHILDREN. N. Kiper, A. Göçmen, U. Özçelik, E. Dilber. Department of Pediatrics, Pediatric Chest Disease Section, Hacettepe University, Ankara, Turkey.

Idiopathic pulmonary hemosiderosis (IPH) is a disorder of unknown etiology and unclear pathogenesis characterized by recurrent episodes of intrapulmonary hemorrhage. Iron deficiency anemia, hemoptysis and diffuse parenchymal infiltrates on chest roentgenogram are the main clinical features of the disease. This study consisted of 23 patients; 12 males and 11 females. All but one patient were diagnosed at our division between 1979-1994. Of the 23 patients, 14 were less than 5 years old at the onset of disease. The youngest was two months of age. There was a history of multiple blood transfusion for anemia in 10 patients. Consanguinity between parents was noticed in 11 patients. Severe pallor, cough, hemoptysis and hepatomegaly were the most common symptoms and physical examination findings of the patients with IPH. All but two patients had hypochromic microcytic anemia of variable severity. In 12 patients, a moderate reticulocytosis was noticed. Chest x-ray was initially abnormal in all children. Diagnosis was based on typical history, anemia, characteristic lung x-ray, and was confirmed by macrophages laden with hemosiderin in gastric washing fluids, bronchoalveolar lavage and open lung biopsy. For treatment, corticosteroid dosages were 5 mg every other day to 2 mg/kg/day, depending on the severity of the attacks (mean duration: 5 years). During the long-term follow-up, none of the patients required blood transfusion. In conclusion, we speculate that genetic predisposition may play role in the etiology of IPH and long-term oral steroid treatment is able to control the severe symptoms and probably disease progression as well.

HUMAN IMMUNOGLOBULIN FOR PNEUMONIA IN PREMATURE INFANTS WITH SEPTICEMIA. M.M. Azimdjanova. Scientific Research Institute of Pediatrics, Tashkent. Uzbekistan.

We have studied pneumonia in 28 premature infants with septicemia, aged from 6 days to 2 months. The general state of the infants was extremely grave with growing symptoms and inhibition of central nervous system. The development of toxicosis was observed in 63% of patients, inhibition and elimination of physiologic symptoms - in 70%. Immunological examinations showed that pneumonia in premature infants with septicemia developed during a decrease in the level of non-specific host defenses with a disturbance of cellular immunity. We have used human immunoglobulin for intravenous injections in the treatment of these infants. The immunoglobulin was administered intravenously in a dose of 15ml 4-5 times with an interval of 48 hours between injections. The infants tolerated the substance very well, there were no adverse effects. After 1-2 administrations of the substance, there were noted significant improvements in general state, a decrease in the symptoms of intoxication, the color of skin integuments changed from gray to light pink. After 2-3 injections, motor activity improved; in 5 infants under nasal feeding, after 3-4 injections the sucking reflex appeared, physiologic reflexes were expressed more actively; after 3-4 injections of normal human immunoglobulin the infants gained weight on average 30-40 g a day. The improvement of clinical picture of disease was accompanied by positive dynamics of immunological findings. The contents of IgG increased 1.5-2 times in comparison with initial levels, the levels of IgA and IgM rose also. A slight increase in T-lymphocyte content was noted in comparison with initial levels.

EXOGENOUS ALLERGIC ALVEOLITIS IN CHILDREN. S. Yu. Kaganov, V.N. Nestarenko. Science Research Institute of Pediatrics and Child Surgery, Ministry of Public Health of Russian Federation, Moscow, Russia.

The problem of exogenous allergic alveolitis is rather important. We observed 120 children with such disease. Their ages ranged from 2 months to 14 years old. According to our data, exogenous allergic alveolitis may be in acute or chronic forms and both may be severe or moderate. Clinical forms of alveolitis accompanied by diffuse fibrosis is of essential danger. The variety of clinical forms is caused by different pathogenetic mechanisms of the disease. Diagnosis is based on inherent clinical symptoms, roentgen-functional examinations and special immunological data. Prompt diagnosis and proper treatment determine the issue of exogenous allergic alveolitis.

EXTRINSIC ALLERGIC ALVEOLITIS (EAA) IN CHILDREN. I. Volkov. Institute of Pediatrics RAMS, Moscow, 117334 Russia.

We examined 34 children with EAA at the age of 2.5-15 years. Most of these children live in the countryside and have daily contact with hay, house birds and domestic animals. 6 children had contacts with parrots. All patients in the acute period had typical clinical features, restrictive ventilation patterns and lowered diffusion of gases in the lungs. 8 children with 1st episode recovered fully, their treatment consisted of short courses of steroids; these children had no more contact with the causative allergen. 15 children were first seen during the 2nd - 4th exacerbation and recovered fully with the same treatment. 13 children seen first during 1st - 4th episode in spite of the treatment showed a progression of the disease since after treatment they had repeated contact with the causative allergens. They required long-term steroids and cuprenil that allowed to stabilize the process without full recovery.

EARLY INFANTILE SYSTEMIC VASCULITIC DISEASE WITH PROMINENT PULMONARY INVOLVEMENT AND RENAL MEMBRANOUS NEPHROPATHY. A.M. Castro, M. Gomes, A. Moreira, V. Nereu, R. Stone, C. Rosa, Rasdo Pinto, Costa Trindade, M.J. Dillon. Department of Pediatrics, Hospital of Faro, Portugal; Department of Pediatric Nephrology, The Hospital for Sick Children, London, England.

The authors report the case of a 6 year-old boy with a multisystem vasculitic disease, which began with serious dyspneic crisis by the age of 8 months with non-fixed pulmonary infiltrates on roentgenography. Three months later, the patient showed cyanotic cutaneous vasculitic lesions of both feet. At the age of 9 months, he had a myoclonic crisis and two tonic clonic generalized attacks. Axial computerized tomography evidenced focal lesions probably ischemic, anatomically correlated with the seizures observed. By 26 months of age, being already under therapeutic treatment with prednisolone, heavy proteinuria with hypo-albeninemia and hyperlipemia was found. Renal function was normal as well C3 and C4 and the renal biopsy showed membranous glomerulonephritis with extra membranous deposits of IgM and IgG. Investigational data showed eosinophilia and elevated IgE. Rheumatoid factor and acute phase reactants were positive. Cutaneous biopsies were inconclusive by the time they were done. The presence of bronchial asthma, eosinophilia and vasculitis affecting two extra-pulmonary systems (skin and brain) suggested the diagnosis of Churg-Strauss Syndrome.

HIGH LEVELS OF EOSINOPHIL CATIONIC PROTEIN INDICATE THE DEVELOPMENT OF EARLY CHILDHOOD ASTHMA. D.Y. Koller, C. Wojnarowski, K.R. Herkner, T. Frischer, I. Eichler. University Children's Hospital Vienna, Austria and LBI of Pediatric Immunology and Endocrinology, Vienna, Austria.

In association with viral infections of the respiratory tract, infants may have episodes of wheezing which represent in some of them the onset of asthma. Activated eosinophils play a central part in asthmatic inflammation in childhood. For this, we investigated whether in infants suffering from their first episode of wheezy bronchitis, eosinophil activation is present and may predict the development of asthma. In a prospective trial, eosinophil activation was measured by eosinophil cationic protein (ECP) in serum in 33 non-atopic infants with respiratory tract infection and wheeze as well as in 15 non-atopic children with upper respiratory tract without wheeze and 18 healthy non-atopic children. One year later the patients were re-evaluated for having asthma. Infants with wheezing bronchitis had higher serum ECP levels than children with respiratory tract infection without wheeze or healthy control subjects ($p<0.005$). In addition, wheezing babies with high serum ECP concentrations were more susceptible to suffer from asthma within one year than patients with low ECP levels. Eosinophilic activation as measured by serum ECP was present even in infants with their first episode of wheezing bronchitis having a high risk to develop bronchial asthma within one year. These data may indicate a predictive value of serum ECP measurements in children with wheeze to identify those patients developing early childhood asthma. These findings also implicate that serum ECP may be used to detect these children with the need of early antiinflammatory treatment.

COMPARATIVE STUDIES OF INFLAMMATORY CELLS AND THEIR MEDIATORS IN DIFFERENT FORMS OF CHILDHOOD ASTHMA. G. Turner[1,2], E.C. Stevenson[1], M.D. Shields[2], R.Taylor[3], M. Ennis[1]. Clinical Biochemistry[1], and Child Health[2], The Queen's University of Belfast and Royal Belfast Hospital for Sick Children[3], Northern Ireland.

Childhood asthma ranges from viral associated wheeze (VAW) in which episodic asthma attacks are triggered solely by viral upper respiratory tract infections with no interval symptoms and no atopy, to "classical" atopic asthma (AA) characterized by frequent interval symptoms and with evidence of atopy. The aim of this study was to investigate the inflammatory cells and their mediators in bronchoalveolar lavage (BAL) fluid obtained from asthmatic and normal children (N) at the time of elective surgery using a non-bronchoscopic method. A standard questionnaire was used to categorize the children (N, n=63, AA, n=29 and VAW, n=17). A differential cell count was performed and eosinophil cationic protein (ECP) and tryptase were determined in the supernatants using commercially available kits. In AA BAL fluid, both eosinophils (median 1.53 range 0.00-6.40%) and mast cells (0.43 [0.00-1.15]%) were significantly elevated ($p<0.00001$) compared to samples from children with VAW (eosinophils 0.20 [0.00-0.74,%; mast cells 0.14[0.00-0.76]%) and normals (eosinophils 0.10[0.00-1.4]%; mast cells 0.20 [0.00-0.92]%). Some children with AA may also have episodic viral triggered asthma attacks, while others have persistent interval symptoms. Both these patterns of AA were associated with elevated eosinophils and mast cells. To date, we have analyzed ECP and tryptase in the BAL fluid of 41 AA, 21 VAW and 47 normals. The ECP was significantly elevated in AA ($p<0.001$) compared to the N and VAW groups. Median tryptase concentrations were similar in all groups (1.62-1.79U/L). We found that AA (both episodic and persistent symptoms) show evidence of chronic eosinophil and mast cell recruitment and this was not seen in VAW.

MEASUREMENT OF CYTOKINES DURING ACUTE BRONCHIOLITIS CAN PREDICT THE DEVELOPMENT OF ASTHMA IN INFANTS. S. Spier, J. Turgeon, J.E. Marcotte, J.P. Yang, S.P. Drblik, M.F. Gagnon, P.M. Renzi. LC Simard and Ste-Justine Research Centers, Pulmonary Units of Ste-Justine and Notre-Dame Hospitals, University of Montreal and Meakins Christie Labs McGill University Montreal, Quebec, Canada.

The objective of our study was to assess whether measurement of the cellular differential, lymphocyte subsets and cytokines could predict the development of asthma after acute bronchiolitis (B). Seven ml of blood were obtained from 32 patients (3.1±0.5 mos. old) admitted to the hospital for B. Plasma was obtained for the measurement of interleukin (IL)-4, interferon gamma (IFN) and soluble CD23 by ELISA. Lymphocytes were isolated by ficoll hypaque centrifugation and depletion of adherent cells, their surface markers were assessed for CD4, 8, 23 and 25 by immunochemical staining and the remaining cells were cultured for three days in medium alone or medium with IL-2 for the analysis of cytokine production. Two years following B, a group of 3 pediatric lung physicians classified the patients by the Delphi consensus method as No (n=14), Possible (n=9) or Probable (n=9) asthma. Results from all 3 groups were compared by analysis of variance (ANOVA) or it's nonparametric equivalent between NO and possible and probable asthma,. Infants with probable asthma had lower plasma IL-4 (282±42 vs 155±27 vs 76±36 Ng/ml, No vs pos vs prob, p=0.004) lower in vitro IFN production in response to IL-2 (123±31 vs 34±20 vs 21±14 Ng/ml, No vs pos vs prob, p=0.02), higher blood monocytes (0.67±.08 vs 1.01±.12 vs 1.06±.13 million, No vs pos vs prob, p=0.02) and higher percentage of basophils (1.2±.2 vs 1.4±.5 vs 2.3±.4%, No vs pos vs prob, p=0.05). We found no difference in the age, serum IgE, family history of atopy, and lymphocyte subsets between all 3 groups. In summary, low plasma IL-4 and in vitro IFN production in response to IL-2 predicts the development of asthma after acute bronchiolitis in infants (Supported by the J.T. Costello Memorial Research fund, Inspiraplex and the QTS).

BIOLOGICAL MARKERS OF EOSINOPHIL AND NEUTROPHIL INFLAMMATION AND BRONCHIOLAR EPITHELIAL DAMAGE IN RESPIRATORY SYNCYTIAL VIRUS (RSV) BRONCHIOLITIS. V. Godding*, L. Galanti*, C. Peterson*, A. Bernard°, Y. Sibille*, E Bodart*. *Pneumologie Pédiatrique, Pneumologie, Biologie Clinique, UCL Mont-Godinne, °Toxicology, UCL Brussels, Belgium; Pharmacia AB, Diagnostics Research and Development, Uppsala, Sweden.

RSV bronchiolitis is an important cause of morbidity in infancy. The symptoms include wheezing and the disease has been related to later development of childhood asthma. Although eosinophilic inflammation has been well described in the pathogenesis of asthma, little is known about eosinophil inflammation and the extent of epithelial damage in RSV bronchiolitis. Serum eosinophil cationic protein (ECP) released by activated eosinophils has been correlated to increased airway inflammation in asthmatics. Myeloperoxidase (MPO) released by neutrophils is used as a marker of neutrophilic inflammation. Clara cell protein (CC16) is produced by non ciliated Clara Cells in the bronchiolar epithelium. CC16 has been found decreased in the broncho alveolar lavage fluid of adult asthmatics. We therefore considered 14 patients admitted to the pediatric ward for RSV bronchiolitis and compared their serum levels of ECP, MPO and CC16 with that of 14 controls with no respiratory disease. The presence of RSV in nasotracheal secretions of all bronchiolitis patients was confirmed by indirect immunofluorescence. The mean age of the patients was 10±6 months. Their SaO_2 was 91.7±2% when admitted. Their mean total eosinophil count was 243.7±301.2/ml; their total IgE was 13.12±15.24 IU/l.

	RSV Bronchiolitis	Controls	P value
ECP (mcg/l)	26.1 ± 19.5	11.9 ± 7.4	p<0.001
CC16 (mcg/l)	4.4 ± 2.6	12.6 ± 9.3	p <0.02
MPO (mcg/l)	113.1 ± 76.4	175 ± 97.4	NS

We conclude that in this population of RSV bronchiolitis patients who needed hospital treatment, serum ECP was significantly increased when compared to controls suggesting the existence of eosinophilic inflammation to some extent. Serum MPO values did not suggest any significant neutrophil inflammation. Serum CC16 values were lower in bronchiolitis patients than in controls possibly reflecting the bronchiolar epithelial damage associated with their condition.

UREAPLASMA UREALYTICUM IS A TRUE PATHOGEN OF THE RESPIRATORY TRACT OF PRETERM INFANTS. J. Ollikainen, T. Heiskanen-Kosma, M.L. Katila, M. Korppi and K. Heinonen. Department of Pediatrics, Kuopio University, Finland.

Background: Although Ureaplasma urealyticum infection is suggested to be a contributory cause of respiratory disease and intraventricular hemorrhage in preterm infants, it's clinical significance is unresolved. Objective: To study the clinical associations of perinatally acquired U. urealyticum colonization in preterm infants. Patients: 78 infants with less than 34 weeks of gestational age (median 31 weeks, range 22-23 weeks; median birth weight 1475 grams, range 370-2730 gm). Methods: The presence of U. urealyticum colonization was studied by obtaining nasopharyngeal culture samples (74 infants), endotracheal culture samples (48 infants) and blood samples (60 infants). The samples were cultured by using both A7 agar and Mycofast® cultivation and identification kit, they were regarded as positive if both methods were positive. The patients were followed-up prospectively, clinical and microbiological data were combined and analyzed. Results: The children with perinatal U. urealyticum colonization differed from those with no colonization in three important ways : 1) They had higher leukocyte counts on the first (18.6 vs 12.4 x 10^9) and on the second (29.0 vs 15.4 x 10^9) days of life ($p = 0.01$, both days). 2) They required more often exchange transfusions (46% vs 5%, p=0.01). 3) They needed higher fraction of inspiratory oxygen (0.97 vs 0.70, p=0.01) on the first day after birth and, similarly, they needed more often high-frequency oscillatory ventilation (45% vs 13%, P=0.02). Conclusions: Increased leukocyte counts suggest the ability of U. urealyticum to induce an inflammatory response in preterm infants. The pathogenicity of U. urealyticum is further supplied by more frequent exchange transfusions in colonized children. The children with U. urealyticum colonization developed more severe acute respiratory failure as expressed by higher fraction of inspiratory oxygen and by more frequent need for high-frequency oscillatory ventilation.

THE COMPARISON OF THE EFFECTS OF CONVENTIONAL MECHANICAL VENTILATION (CMV) AND HIGH FREQUENCY OSCILLATION (HFO) COMBINED WITH PARTIAL LIQUID VENTILATION IN THE LAVAGED LUNG ANIMAL MODEL. M. Tamura, T. Nakamura, J. Baba, T. Yoda, E. Shimazaki, T. Yamazaki, S. Iwata, M. Uschikubo, S. Kim and H. Adachi. Nagano Children's Hospital, 3100 Toyoshina-chou, Nagano-ken, Japan.

Introduction: We compared the effect of CMV and HFO combined with perfluorocarbon-associated gas exchange. Method: Twelve adult white rabbits were tracheotomized and put on Humming II. After a total lung lavage with normal saline, animals were ventilated with CMV mode (FIO_2=1.0, pressure=25/5cmH_2O, mean airway pressure (MAP)=15cmH_2O, rate=30/min) or HFO mode (frequency=15Hz, FIO_2=1.0, MAP=first 15cmH_2O then 20cmH_2O). Fluorinert FC84 (FC84: C_7F_{16}) was instillated into the trachea (loading dose: total 15ml/kg divided in three doses, maintenance dose: 5 ml/kg/hour). The ECG, arterial blood pressure, CVP, body temperature, airway pressure and the movement of thorax were monitored continuously, and arterial blood gas analysis and measurement of tidal volume were repeated. After four hours of mechanical ventilation, animals were sacrificed and the lungs were removed for pathological studies. In one animal, a chest x-ray film and a CT-scan of the chest were taken. Results: While on the CMV mode, oxygenation improved in a dose-dependent manner; on the HFO mode, oxygenation, CO_2 elimination and vibration of the chest deteriorated when a large dose of FC-84 was instillated, which was compensated by increasing the mean airway pressure from 15cmH_2O to 20cmH_2O. The chest CT-scan taken at several airway pressure levels suggested that an adequate size of surface area between the perfluorocarbon and inspiratory gas is crucial to keep the ventilatory effect of HFO. Histological study showed well expanded alveoli and minimum formation of hyaline membrane in both groups. Conclusions: The combination therapy with HFO and perfluorocarbon was not as effective as CMV in the lavaged lung rabbits. A high mean airway pressure was required with HFO.

EFFECT OF CONTINUOUS OR PULSE ADMINISTRATION OF DEXAMETHASONE ON LUNG MECHANICS OF INFANTS IN PROLONGED MECHANICAL VENTILATION. L. Cattarossi and F. Macagno. Department of Neonatology, Ospedale Civile di Udine, Udine, Italy.

The use of steroids in order to reduce the length of mechanical ventilation in preterm infants is very popular. Different protocols have been used, generally with good results. However the impact of the various protocols on pulmonary mechanics is only partly understood. Therefore we measured lung mechanics in 16 preterm infants who still required mechanical ventilation at 3 weeks of postnatal age before, after 2 weeks, and at the end of two different regimens of steroid therapy. The infants were assigned to three groups: continuous therapy (dexamethasone 0.5 mg/kg for 3 days, 0.3 mg/kg for a further 3 days and then decrease of 10% of the dose every 3 days for a total of 28 days, n=7, birth weight 1073±341 grams), pulse therapy (dexamethasone 0.5 mg/kg for three days every 10 days, until 36 weeks of post-menstrual age, n=6, birth weight 924±287 grams), control (standard therapy without administration of steroids, n=3, birth weight 932±99 grams). Total Compliance (Crs) and Resistance (Rrs) of the respiratory system were measured with the single breath occlusion technique, and Functional Residual Capacity (FRC) with nitrogen wash-out. The results are shown in the table.

		Continuous	Pulse	Control
Crs (ml/cmH_2O/kg)	Before	0.53±0.25	0.66±0.17	0.69±0.25
	Two weeks	1.18±0.26	1.10±0.43	0.74±0.33
	End	1.00±0.16	1.10±0.31	0.83±0.25
p (one-way Anova)		**0.0001**	**0.07**	**0.8**
Rrs (cmH_2O/ml/sec)	Before	0.172±0.08	0.220±0.08	0.364±0.09
	Two weeks	0.103±0.03	0.161±0.05	0.189±0.05
	End	0.099±0.04	0.122±0.03	0.168±0.04
p (one-way Anova)		**0.061**	**0.048**	**0.041**
FRC (ml/kg)	Before	13.6±4.2	18.6±2.1	14.0±1.4
	Two weeks	22.0±4.3	21.8±3.8	17.5±3
	End	22.1±2.1	25.9±2.8	17.5±1
p (one-way Anova)		**0.001**	**0.003**	**0.12**

Both continuous and pulse therapy determined a significant improvement over time of the Crs and FRC which remained unchanged in the control group. Rrs decreased in all groups. Our data confirm that steroid administration in infants who failed weaning from the ventilator have a beneficial effect on pulmonary function. The effect of the two regimens of therapy studied appears to be superimposable. We conclude that the main effect of steroids on lung mechanics of the neonates studied is an improvement of Crs with subsequent increase of FRC. The reduction of Rrs seems to be related to the natural course of the events.

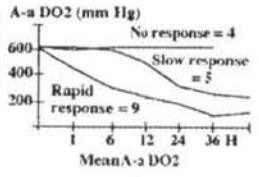
INHALED NITRIC OXIDE (NO) IN SEVERELY HYPOXEMIC NEWBORNS. P. Lagier, J.M. Dejode, F. Soula, C. Mathey, M. Pradal, S. Arnaud, F. Pasteau. D.A.R., CHU Nord, Chemin des Bourelly, 13915 Marseille Cedex 20, France.

Inhaled NO is a selective pulmonary vasodilator without deleterious systemic effect. Trials demonstrated improvements in infants with persistent pulmonary hypertension of the newborn (PPHN). Methods: We studied the efficacy of NO inhalation in 18 consecutive newborns. Patients were eligible if they had severe respiratory failure defined as a differential alveolar arterial oxygen (AaDO2) of more than 550 mmHg. NO was obtained in a concentration of 450 ppm and administered into the inspiratory line of a high frequency oscillatory ventilator (HFOV). Results: Mean gestational age and birth weight were 36 weeks (29-41) and 2540 gms (1000-3510) respectively. The etiology of respiratory failure was variable (6 respiratory distress syndrome, 4 sepsis, 4 perinatal asphyxia, 3 pulmonary hypoplasia and 1 meconium aspiration syndrome). 9 baseline echocardiographic measurements were performed and 7 PPHN were diagnosed. NO therapy was initiated at 22 hours of age (2-60) with an average duration of 48 hours (3-98). No infant received a dose of more than 40 ppm. Response was categorized as rapid improvement < 1 hour, slow improvement > 6 hours and no response.

Discussion: Sustained improvement was observed in all responders. No improvement in the oxygenation was seen after 12 hours of treatment. This study confirms that inhaled NO in combination with HFOV is an effective therapy in many newborns with severe respiratory failure. Combined modalities may improve outcome and reduce the need for AREC. Follow-up studies are useful to identify long-term toxic effects.

	Rapid response	Slow Response	No Response
Alive	9	4	2
ECMO	0	0	3
PPHN	3/4	1/2	3/3
Surfactant	5	2	3
Air leaks	1	2	2
IVH	1 grade 4	1 grade 2	2 grade 2

ECMO: Extracorporeal membrane oxygenation.
IVH: Intraventricular hemorrhage.



INHIBITION OF EXERCISE-INDUCED ASTHMA BY NEDOCROMIL SODIUM DELIVERED VIA A "SYNCRONER" DEVICE. B. Eichler*, M.T. Antonini**, B. Melloni*, O. Faure**, R. Menier**, F. Bonnaud*. *Service de Pneumologie, **Service d'Exploration Fonctionnelle Respiratoire, CHU Limoges, France.

Recent studies have reported that nedocromil sodium is an effective drug used to prevent exercise-induced asthma (EIA). The purpose of this study was to evaluate the effect of nedocromil sodium delivered by a syncroner device on childhood exercise-induced asthma. Eleven asthmatic children aged six to fifteen years were recruited. All patients had an atopic asthma and a reproducible EIA provoked by running continuously for 5 mn. A first exercise test (J1) was performed with evaluation of FEV_1 before and after exercise, and was always positive. Seven days later, the same test (J7) was repeated with two puffs (4 mg) of nedocromil sodium given thirty minutes before exercising. The percentage fall index (FEV_1 after exercise - FEV_1 at rest/predicted FEV_1) was measured in each case. Direct comparison between the mean of FEV_1 after exercise at J1 and J7 was statistically different. In individual patients, complete protection was provided in 9 patients. No side effects were observed. Nedocromil sodium delivered by syncroner device could be used in the prevention of EIA in asthmatic children.

THE EFFECT OF INHALED SALMETEROL XINAFOATE ON EXERCISE INDUCED ASTHMA IN SINGAPORE CHILDREN. Daniel Y.T. Goh, Lee Bee Wah, Khor Sek Hoon. Department of pediatrics, National University of Singapore, Singapore.

Exercise-induced asthma (EIA) occurs in about 50% of asthmatic children in Singapore. This study aimed at evaluating the usefulness of a long-acting inhaled beta-agonist, Salmeterol Xinafoate (SX) for EIA prevention. A double-blind, cross-over placebo-controlled trial was conducted on 13 asthmatic children and adolescents aged 6 to 16 years with EIA, which was defined as a 15% or more reduction in FEV_1 following 5 minutes of free-running. Exercise challenge was carried out 1 hour and 8 hours after a single 50 µg dose of SX or placebo via diskhaler. Our results showed that SX prevented EIA in 11/13 at 1 hour and 9/13 at 8 hours, compared to 2/13 and 4/13 respectively with placebo. In addition, the median percentage decrease in post exercise FEV_1 with SX was 5.1% and 10.8% at 1 and 8 hours, in contrast to 25.3% and 26.4% at 1 and 8 hours with placebo ($p < 0.05$). This study shows that SX has a role in EIA prevention, and its effectiveness up to 8 hours provides a convenient dosage interval for our school-going children.

CLINICAL COMPARISON OF FIVE SPACER DEVICES IN ASTHMATIC CHILDREN. J.C. Dubus, N. Stremler, L. Mely, B. Bruguerolle. Department of Pediatrics, CHU Timone Enfants, and Department of Experimental and Clinical Pharmacology, Faculté de Médecine, Marseille, France.

Varied spacer devices are now commercialized in France to facilitate drug deposition into the lung of asthmatic children. The aim of this study was to compare the effect of 200 micrograms salbutamol delivered with Aerochamber®, Aeroscopic®, Babyhaler® with face mask, Nebuhaler® or Volumatic®. One hundred asthmatic children were recruited and randomized in five groups of twenty patients. The following protocol was done for each patient in consultation: three measures of peak expiratory flow rate (PEFR) with a Standard VITALOGRAPH® peak flow meter (Vitalograph Ltd, Buckingham, England), then two separate puffs of salbutamol MDI through one of the five spacer devices, and five minutes later three other measurements of PEFR. The maximal value was noted before and after bronchodilatation. Each randomized group was comparable regardless of age (8.85 years), gender, height, weight and beginning, severity, etiology and treatment of asthma. Mean baseline PEFR did not differ. The best mean percentage improvement (18.38 ± 3.67%) was obtained with Babyhaler® ($p=0.008$). Reasons for the clinical relevance of this spacer device are unclear, maybe proportional to diminished electrostatic forces and/or more easily mobilized valves. The Babyhaler® with face mask, usually reserved to infants, should be extended to older children.

SALBUTAMOL AND BECLOMETHASONE TREATMENT THROUGH A NEW SPACER BABYHALER® IN INFANTS WITH CHRONIC ASTHMA: A PROSPECTIVE STUDY. C. Marguet, B. Lukomska, L. Kohen, E. Mallet. Pediatric Respiratory Diseases Unit, Hôpital Ch. Nicolle, Rouen, France.

We evaluated in 59 infants the efficacy of a 6-week inhaled treatment (inhT) through a new spacer Babyhaler® (BH®). 3 groups were specified: with chronic cough (C), infantile wheezers (W) and with severe continuous symptoms (SOD). inhT was salbutamol (S) 200 µg x 3 with beclomethasone (B) 250 µg (500 µg in SOD) twice a day. Mean ages were respectively 29 ± 11; 27 ± 15.6 and 20 ± 14 months. Ages of onset were respectively: 14.2 ± 13; 7.2 ± 5 and 7.3 ± 9.3 months.

Chronic symptoms	Cough (11)				Wheezing (29)				S.O.D. (18)			
	be	after 6w			be	After 6w			be	After 6w		
	fore	R	I	F	fore	R	I	F	fore	R	I	F
exacerbation signs	92	55	36	9	100	65	30		100	27	53	20
exercise signs	92	44	44	11	76	65	35		95	33	33	33
thoracic hyperinflation	73	100			44	75	25		100	80		20
sleep disorders	45		75		65		65		72		69	
auscultatory signs	54	100			46	92	8		72	85		15
Fitness improvement		64				76				77		
exacerbations (n)*		3				7				7		
Efficacy: recovery				27				65				28
improvement				73				35				61
failure				0				0				11

R: Recovery **I: Improvement** **F: Failure**
*number of children with exacerbation during the 6w treatment. All with fever.

Acceptability of BH®was excellent but 3 cases. Adverse events were mild excitement. Parent's evaluation of efficacy was always better than previous treatment. We conclude that S + B through BH® appears to be a well tolerated and efficient inhT in infants asthma. Asthma otherwise plays a role on sleeplessness even in infants.

THE EFFICACY OF NEOTHEOPEC IN TREATMENT OF CHILDREN WITH BRONCHIAL ASTHMA. A.V. Lyapunov, I.I. Balabolkin, I.E. Smirnov, V.S. Reutova, A.G. Kucherenko. Research Institute of Pediatrics, Moscow, Russia.

We examined 14 children with bronchial asthma treated with the new sustained release theophylline (Th) preparation Neotheopec (Russia). Each tablet contains 300 mg Theophylline, anhydrous. Neotheopec was used twice

a day. The dosage varied from 15 to 20 mg/kg/day. The mean duration of treatment was 25.5 days. The concentration of Th in blood serum was determined by the High Performance Liquid Chromatography method. After 10 days of treatment the daily monitoring of Th concentration revealed that the concentration of Th was within the therapeutic concentration levels (10-20 mg/l) during the whole period of medication. Mean Th levels varied between 8,1 mg/l before the morning intake and 18,2 mg/l 8 hours after intake of the morning dose. The improvement of respiratory function became apparent on the 10th day of treatment. We revealed that the increase in FVC was 12%, FEV_1 -18%, PEF -19%, FEV_1/FVC -6%, MEF_{25} -17%, MEF_{50} -22%, MEF_{75} - 28%. There were no serious side-effects during treatment with Neotheopec. Nausea occurred initially in 2 cases but was resolved without dosage modification. The number of bronchial asthma night attacks was apparently decreased during treatment with Neotheopec. The high efficacy of Neotheopec in treatment of children with bronchial asthma was revealed.

VARIOUS FORMS OF THEOPHYLLINE IN THE THERAPY OF BRONCHIAL ASTHMA IN CHILDREN. O.N. Tarasova, N.I. Bekman, A.S. Glybin. Research Institute of Pediatrics and Children's Surgery of Ministry of Public Health, and Institute of Biotechnologia, Moscow, Russia.

The knowledge of the many factors affecting the pharmacokinetics of theophylline is necessary in order to achieve the maximal therapeutical effect and the exception of the development of collateral reactions. Various forms of theophylline therapy should be prescribed under the control of concentrated theophylline in blood serum. Presently, for determination of theophylline concentration, we use the "Theo-Test" immune-enzyme method, which is very precise, quick and inexpensive. 0.005 ml of serum is sufficient for analysis. The therapeutical effects of euphyllin treatment was good correlated with Cmin (minimum theophylline concentration) and FEV_1 was distinctly dependent on Cmax (maximal theophylline concentration). Many pharmacological factors were dependent on the ages of the children. Cmin, Cmax, C (average integrated concentration) were higher in remission periods of bronchial asthma, in comparison with attack periods. We have found, by means of pharmacokinetical approach, that euphyllin may be given orally every 4-5 hours. At present, we successfully use the prolonged forms of theophylline: Theopek (Russia), Theotard (Slovenia-Germany), Retafil (Finland), Durophillin (Yugoslavia), in each case for best effective treatment.

BRONCHODILATOR RESPONSIVENESS AFTER IPRATROPIUM BROMIDE IN ASTHMATIC CHILDREN. A. Bouchez-Buvry, Z. Campos, J. Paries, J. Gaudelus. Jean Verdier Hospital, 93143F Bondy Cedex.

Asthma is the most frequent bronchopulmonary disease during childhood. Physiopathological mechanisms of asthma involve acetylcholine-mediated bronchoconstriction but the specific indications for anticholinergic therapy in management of childhood asthma are still debated. The aim of this study was to determine the bronchial responsiveness to atropinic Ipratropium Bromide (IB) in 116 asthmatic children, aged 2-7 years, during a steady-state period of their disease. Bronchodilatation was defined as a 20% decrease in total pulmonary resistance (TPR, $cmH_2O.L^{-1}.s$) or/and a 20% increase in dynamic lung compliance (C_{LDYN}, $L.cmH_2O^{-1}$) determined by the esophageal balloon technique. TPR and C_{LDYN} were first measured after inhalation of 40 µg IB and then after 200 µg salbutamol via a large volume spacer and compared with the values observed at baseline. IB caused a bronchodilatation in 44 children (group 1) but not in 72 others (group 2). The further inhalation of salbutamol allowed an additional bronchodilatation in 1 child in group 1 and 7 children in group 2. Age, sex, baseline functional residual capacity, blood gas, chronic treatment, compared by X^2 were not significantly different between the groups. However, children who had a gastroesophageal reflux (GER) had more significant bronchodilatation after IB inhalation compared with children without GOR. This is in favor of a cholinergic-mediated reflex between the esophagus and the bronchi in the pathophysiological mechanisms of asthma associated with a GOR. These results demonstrate that IB improves the respiratory function in a large population of young asthmatic children and IB should be considered as an effective choice in the chronic treatment of asthmatic children, particularly in GOR-associated asthma.

THE ACUTE BRONCHODILATATORY EFFECT OF SALMETEROL ON THE METHACHOLINE-INDUCED BRONCHO-CONSTRICTION IN CHILDHOOD ASTHMA. A. Baki, G. Karagüzel. Dept. of Pediatrics, Faculty of Medicine, Karadeniz Technical University, Trabzon, Turkey.

Review of the literature highlights a need for research particularly on the Acute Bronchodilatatory Effect of Salmeterol (ABES) on bronchoconstriction in the pediatric age group. This study attempted to evaluate the ABES on methacholine-induced bronchoconstriction in childhood asthma through comparison with the effect of salbutamol. Forty-four asymptomatic children with mild-to-moderate asthma (17 male, 27 female aged 7-17 years) were studied. At the beginning, baseline Fev_1 and SaO_2 were measured, and methacholine challenge was performed to determine PC_{20}. At same time, SaO_2 level was measured again. Thereafter, the patients inhaled respectively, 25 µg of salmeterol (n = 27, group I) or 100 µg of salbutamol (n = 17, group II), and the same measurements (Fev_1, SaO_2) were repeated at the 5th and 20th minute after inhalation. Although salmeterol and salbutamol led to a significant improvement of Fev_1 and SaO_2 levels at PC_{20} at the 5th minute ($p < 0.01$), Fev_1 and SaO_2 levels at the 20th minute seemed to reach baseline values in each group ($p > 0.05$). Fev_1 and SaO_2 levels at PC_{20} after the 5th and 20th minute were significantly different when compared to each other within each group ($p < 0.01$). However, the differences between group I and group II were not found significant ($p > 0.05$). From these findings, we conclude that salmeterol can be considered as effective as salbutamol on methacholine-induced bronchoconstriction in the studied period.

EFFECTIVENESS OF INHALED CORTICOSTEROIDS IN SEVERE AND MODERATE ASTHMA. M.A. Geppe, A.V. Karpushkina, T. Yu. Shcarbanenko. Moscow Medical Sechenov Academy, Moscow.

The aims of the research were to evaluate the effectiveness of inhaled corticosteroid (ICS) therapy - beclomethasone dipropionat and flunisolide (becotid, ingacort). The majority of children (58) had severe asthma while 8 patients had moderate asthma. Ages were 15 months up to 15 years. 10% of patients suffering from severe asthma improved soon after 1 or 2 courses of ICS for one month. In 90% of the patients, the duration of ICS treatment varied from 3 months up to 2 years. In moderate asthma, ICS was used in cases of continuous airflow obstruction; ICS was used only for one month in lower dosage. ICS dependence did not occur in this group of patients. When using ICS, the dosage of bronchodilators (beta 2 agonist and methylxanthines) was reduced considerably. Adverse effects were rare (dysphonia, oral candidiasis) and observed only during 1 or 2 weeks of the treatment. ICS are highly effective in severe and moderate asthma in children. Adverse effects are minimal and there is no dependence on duration of treatment and age of patients.

COMPARATIVE STUDY OF BONE DENSITOMETRY IN ASTHMATIC PATIENTS VERSUS NORMAL (HEALTHY) CHILDREN. A. Milinarsky, D. Casanova. Medicine School, Valparaiso University, Infantil Medical Institute, Valparaiso, Chile.

Introduction: Bronchial asthma due to its inflammatory pathogenesis or steroid treatment could influence the increase of bone mass. The aim was to compare bone mineral density in asthmatic children with normal (healthy) children. Methods: Two samples at random of children with similar ethnic background and same socioeconomic level between the ages of 3 to 17 were studied. One sample included 127 asthmatic children without other pathologies, the other 218 healthy children. Both samples were separated by sex, the sample of asthmatic children was divided into mild and moderately-severe, and according to use or non use of inhaled corticosteroids. All groups were similar in age. All underwent X-ray absorptiometry, radiocubital distal and ultradistal, with a DTX 100 single photon densitometer, to measure bone mineral density (BMD) and to calculate corrected T score (T score x 10/body mass index) of distal (TSIDC) and ultradistal (TSUIDC). In all of the groups, mean values of corrected and uncorrected T score distal and ultradistal were compared. Height and age were correlated with T score in each of the groups. ANOVA, t Student test and Mann Whitney tests were used. Results: No significant difference was found in average of TSIDC and TSUIDC in healthy and asthmatic children, nor in mild and moderate-severe asthmatics, nor among those using inhaled corticoids. Correlation between height and age was similar among all groups studied. Conclusion: Asthmatic children presented similar corrected T scores to healthy children regardless of age or sex. There was no difference between the different severities of asthma, nor among those with or without inhaled corticoids. Height was not affected by asthma, nor by its severity, nor the use of corticoids.

SEVERE AND MILD ATOPIC BRONCHIAL ASTHMA IN CHILDREN. I.I. Balabolkin, A.V. Kudrjavtsera, A.G. Kucherenko, Ch.M. Markov. Pediatrics Research Institute of the RAMS, Moscow, Russia.

We investigated the peculiarities of development and efficiency of pathogenetic treatment of atopic bronchial asthma (BA) in 85 children. Group I consisted of 50 children with severe BA. Group II consisted of 35 children with mild atopic BA. The duration of disease averaged 4.5 years. The age of patients was from 2 to 15 years old. The frequency of some premorbid and causal factors in these groups of children with BA is shown in the following table:

	Group I	Group II
Family atopic history	54%	45%
Atopic dermatitis	30%	17%
Respiratory viral infections	76%	88%
Drug allergy	58%	48%
Food allergy	54%	55%
Sensitization to dust mites	50%	34%
Sensitization to mold	27%	13%
Psycho-emotional stress	37%	18%

The duration of the course of treatment in these groups was from 3 to 6 months. In group I, treatment with Intal, inhaled corticosteroids (ICS) (beclomethasone, budesonide, flunisolide) and sustained-release formulations of theophylline (theotard, theopec) enabled us to achieve clinical remission in 42 children (84%) with a lighter course of disease in 8 cases (16%). A decreased blood plasma cortisol level was found after two weeks of the treatment with following ICSs. The level was normalized after one month of the treatment. In group II, treatment with Intal, sustained-release formulations of theophylline enabled us to achieve the remission of BA in 29 cases (83%) with a lighter course of disease in 4 cases (11%). This treatment was ineffective in only two cases (6%). Clinical remission in these patients was achieved after administration of ICSs.

BONE DENSITY DECREASED IN ASTHMATIC CHILDREN TREATED BY INHALED BUDESONIDE. M. Bakir, I. Barlan, F. Tükenmez, M. Nursoy, M. Basaran. Marmara University Hospital, Pediatric Allergy-Immunology Department, Istanbul, Turkey.

Increased use and earlier introduction of inhaled corticosteroids in the long-term management of asthma raises concerns about the side-effects of these medications in children. There is no published data on the effect of long-term inhaled budesonide therapy on bone density in asthmatic children. In a cross-sectional study, we compared bone density of 13 children (3-13.5 years of age) with moderate to moderately-severe asthma receiving inhaled budesonide at a daily dose of 400-800 μg/day for 7-45 months (Group I), with age- and sex-matched 11 mild asthmatic controls (Group II). L1-L4 spine density was measured by dual-energy-x-ray absorptiometry (DEXA). Data were converted to z scores and compared between the two groups. Height measurements were converted to z scores and baseline values were compared with the values obtained during the last visit in each group. Bone density of patients in Group I was found significantly lower than that of the Group II (Mann-Whitney U test, p=0.04). Multiple regression analysis did not reveal any significant correlation between bone density (dependent variable) and either cumulative budesonide dose (regression coefficient=0.003, p=0.3) or the duration of treatment (regression coefficient=0.07, p=0.28) in group I. Height Z scores did not change significantly in either group during the study. Bone density may be affected in asthmatic children due to long-term treatment with inhaled budesonide. The findings remains to be confirmed with longitudinal studies.

THE EFFICIENCY OF "FUNCTIONAL RELAXATION" IN COMPARISON WITH SALBUTAMOL AND A PLACEBO RELAXATION TECHNIQUE IN ASTHMATIC CHILDREN - A PROSPECTIVE RANDOMIZED STUDY. T. Zimmermann, T. Loew, F. Rosner, P. Martus. Pediatric Clinic and Dept. of psychosomatic Medicine, University of Erlangen, Germany.

Introduction: Functional relaxation (FE), a somato-psycho-therapeutic method, can reduce asthmatic symptoms. Rationale for this study: The efficiency of a 5 minute introduction of elements of FE is compared with a placebo-relaxation-method, which is not based on the hypothetical mechanisms of FE, and a standardized pharmacological bronchodilatative test using Salbutamol. Methods: In a controlled randomized single blind setting, 18 children and adolescents with acute asthma were treated on three consecutive days with each method. Before and 10 minutes after treatment, the patients had bodyplethysmographic pulmonary function testing. U-tests showed that the baseline measurements were comparable. The before-and-after comparison revealed significant changes for the elements of FE (eFE) and Salbutamol, not for the placebo-relaxation method. There were significant differences between the intra-individual differences of airway resistance and specific airway resistance between salbutamol and the placebo-relaxation method, not between eFE and Salbutamol or between eFE and the placebo-relaxation-method. Conclusion: This study supports the benefit of psychosomatic treatment in the relief of asthma in children. The procedure can be used as an easy to learn relaxation technique to be used during acute asthmatic airway obstruction as complementary treatment or used in prevention.

SPECIFIC (SIT) AND NON-SPECIFIC IMMUNOTHERAPY (NSIT) OF ASTHMATIC CHILDREN. L.S. Namazova, I.I. Balabolkin, V.A. Revyakina. Institute of Pediatrics RAMS, Moscow, Russia.

Background: Immunotherapy (IT) is the most pathogenetic treatment of the disease. It is often prescribed without serious preliminary examination and estimation of its future effects is very difficult as well. Patients: 62 asthmatic children aged 6-14 years old: 32 were treated by house dust mite allergen parenterally (SIT); 10 had parenteral treatment by thymalin, 10 - by antiallergic immunoglobulin, 10 - by taktivin (NSIT). 20 same-aged healthy children were used as controls. Methods: We investigated blood levels of IL-1α, IL-2, IgE, β2-MG, LTB4, PGE, PGF2α, C3a-,C4a-, C5a-des-Arg (by RIA kits, Amersham, UK and ot.), IL-1 production by monocytes in biological testing and IgA, IgM, IgG, CIC, T-ROC, Ta-ROC by classical methods. Results: Asthmatic children had changes in all these indices compared with controls. Clinically effective IT (estimated after 6 mo.) was accompanied by the normalization of increased IL-2, β2-MG, PGF2α, EA-ROC, C3a-des-Arg, CIC ($p<0.05$). Good efficacy of SIT was observed if we began therapy at the moment of high blood levels of IL-2. In contrast, NSIT was effective if we had low IL-2 blood levels at the start of the treatment. Conclusion: We believe that more detailed immunological examination is necessary to choose an appropriate method and make IT more effective.

EFFECTIVENESS OF USE OF N-3 POLYUNSATURATED FATTY ACIDS (PUFA) IN COMPLEX THERAPY OF CHILDREN WITH BRONCHIAL ASTHMA. Z.Y. Gorelova, L.D. Ksenzova, G.F. Zadkova, I.I. Balabolkin, G.I. Smirnova. Scientific Research Institute of Pediatrics, Moscow, Russia.

N-3 PUFA are able to inhibit release of arachidonic acid (20:4) (AA), decrease lipid profile of blood plasma and have hemorrheologic properties. Exogenic eicosapentaenoic (20:5) and docosahexaenoic (22:6) acids penetrate the lipid layer of biomembranes and have a stabilizing effect on the membranes. The goal was to study the effectiveness of n-3 PUFA-containing medicine - Polien (Russia) - a concentrate of 20:5, 22:6 acids from hydrobiont fat. 52 children aged 1 to 14 years diagnosed with bronchial asthma (BA) were examined. Of these, 44 children received basic therapy (including Claritin - 5-10 mg per day) and Polien - 2-4.5 g per day, dosage depending on age, for 30-40 days. Test group - 8 children - were treated similarly, except for Polien. Comparative analysis of effectiveness of received therapy showed improvement of clinical picture of bronchial asthma at close catamnestic observation in the form of decreased severity (60%) and frequency of attacks (45%) as compared to the test group. Against the background of this therapy, volume of used bronchospasmolytic treatment and the number of repeated hospitalizations decreased. Duration of remission of BA increased 2-3 times. By the end of the course, there was a considerable decrease, as compared to the control group, of AA 20:4 metabolites in granulocytes of peripheral blood: prostacycline, prostaglandin F2α, prostaglandin E2 ($p<0.05$, $p<0.05$, $p<0.1$ correspondingly). There was a 1.5-3 times increase of 20:5, 22:6 content in plasma and erythrocyte membranes, as compared to initial data, and a slight decrease of AA 20:4 level. An activation of lymphocyte membrane receptors of peripheral blood dynamics was revealed. Thus, received clinical and laboratory data allow us to recommend the use of such forms of n-3 PUFA in complex therapy.

PSYCHOLOGICAL ASPECTS OF BRONCHIAL ASTHMA IN CHILDREN. S.I. Erdes, Z.S. Umarova. Department of Pediatrics, Moscow Medical Academy, B. Pirogovskaya str., 19 Moscow, 119435, Russia.

The influence of psychological disturbances on the course of bronchial asthma was studied in 264 children. The following methods were used: conversation, colored Lousher test, drawing test, uncompleted sentence test - Sax-Sidney version, Daembou-Rubinschtein test. 3 years, 7 years and adolescence are the ages of psychological crises. At the same time, these are

ages of high risk of asthma onset (35% of tested children developed illness by those ages. Interfamily connections showed a high importance in development of relapses of bronchial asthma. Possible explanations of this are: 1) deviation of parental position - inadequacy in accepting the child's disease; 2) hysterical, agnosological, shunt-like behavior of child. Relationship between contemporaries are the cause of social-psychological inadaptability of teenagers comparatively to the younger age group. Adolescents with bronchial asthma showed high levels of anxiety, fear, emotional liability, egotism, infantilism, high degree of emotional connections with parents and dependence on them. Male patients had diminished self-esteem on the basis of "power-parameter", female - on appearance accept. They negatively evaluated their future. The principle of psychological correction was included in complex therapy of bronchial asthma. Effectiveness of group methods and psychocorrectional games was demonstrated for children of 7-10 years. At the same time, importance of individual methods were shown for teenagers. The result of complex therapy was more successful, when parents' help was used.

IMMUNE RESPONSES AFTER CRENOTHERAPY IN ALLEVARD SPA. J.E.L. Kaissouni, M.N. Kolopp-Sarda, Ph. Perrin, R. Jean, M.C. Bene, G.C. Faure. Lab. Immunology & Pediatrics ENT, Fac Médecine & CHU de Nancy, Allevard SPA, France.

Crenotherapy is frequently prescribed to children suffering from recurrent infections of the upper respiratory tract. Sojourns in the spa of Allevard are especially recommended and useful to reduce the number of infections during the following winter. We investigated in which way this clinical improvement could be related to modifications of immune responses. Peripheral blood and/or saliva samples were obtained before and after 1 month of hydrothermalism in Allevard from 40 children aged between 5 to 14 years old over a period of 5 years. Flow cytometry on purified lymphocytes was used to assess the partition of peripheral lymphocyte subsets with monoclonal antibodies to CD3, CD4, CD8, CD 57, CD16, CD56, and the integrins LFA1 and VLA4. In saliva samples, specific IgA directed to *Haemophilus influenzae, Streptococcus pneumoniae, Klebsiella pneumoniae* and *Streptococcus pyogenes* were assayed using an ELISA test developed in the laboratory. Two groups of children could be defined, having either lowered CD3- cells or increased CD8-/CD57+ cells before their first stay in Allevard. After the first, and even more after the second hydrothermal treatment, both these profiles had disappeared, and these children had nearly normal peripheral lymphocyte subsets. A decrease was also noted in CD16+ cells. Only minor variations in the levels of CD56+, LFA1- or VLA4+ cells were noted, but initial levels usually were within the normal range. In the saliva, significant levels of specific IgA directed to the four bacteria tested were observed in most children before they left for Allevard. After the treatment these antibodies were at lower levels suggesting that hydrothermal treatment had induced a decrease of the antigenic charge. In conclusion these data provide information suggesting that 1 month of hydrotherapy during the summer significantly improves the immune status of children suffering from recurrent infections of the respiratory tract both at the cellular and humoral levels.

REPRODUCIBILITY OF SKIN PRICK TESTS IN WHEEZING INFANTS. E. Paty, C. Karila, S. Waernessyckle, J. de Blic, P. Scheinmann. Hôpital des Enfants Malades, Paris, France.

Reproducibility of skin prick tests in asthmatic infants has not yet been studied. 59 asthmatic infants (mean age: 14 months (9-19), 5 of them suffering from atopic dermatitis were skin prick tested twice by the same investigator (five prick tests and two positive controls (histamine 1 mg/ml, codeine phosphate 9%) plus a negative control. Prick tests performed were Dermatophagoides pteronyssinus, cat dander, cod fish, white egg, peanut (Stallergenes Fresnes, France) with a standardized methodology. Positivity of skin prick test was defined as a mean wheal diameter >2 mm than the diluent. The mean wheal diameter of histamine and codeine phosphate was 2.5 mm ± 2.4. Histamine and codeine phosphate elicited different positive skin responses. However the reproducibility of positive controls was good. The coefficient of variability was 15 %. 13 infants had a dermographism with a low reproducibility. There were only 2 positive and reproducible skin prick tests to Dermatophagoides pteronyssinus and cat dander. In 16 infants, skin responses to Dermatophagoides pteronyssinus were positive only once and were therefore considered as false positive reactions. Five patients gave positive and reproducible skin responses for egg, cod fish and peanut. Further studies are necessary to assess the benefit of prick tests in wheezy infants.

FAIRY TALES AS A METHOD OF EDUCATION OF CHILDREN WITH BRONCHIAL ASTHMA. D.A. Lezhava, I.G. Rtskhiladse. Children's Hospital "MRCHEVELI", Tbilisi, Republic of Georgia.

Education of patients suffering from Bronchial Asthma (BA) and their parents make it possible to perform adequate control over the treatment and prophylaxis of the disease. In the interest of 5-13 year old children, it would be better to pass along information on their disease through fairy tales, as this form seems more natural and easy to accept for children. We used original tales about the disease (eventually, a computer game script). Research work was conducted at the Children's Hospital "MRCHEVELI", in out-patients. We examined 2 girls and 17 boys aged 7-13 (average age 9), who had moderate and severe forms of BA. Group I: 11 patients received information on BA through fairy tales. 1 patient was excluded from the research because of his unwillingness to answer the questions. Group II: 8 patients received information on BA by means of traditional methods of education. In both groups the information level was evaluated by a 10-point score system. The average number of scores in group I was 9.30, in group II, 7.62. On the basis of this data we can conclude that the method of informing patients through fairy tales has an advantage over traditional methods of education in this age group and that it can be used as a scenario for educational computer games.

EDUCATION OF MOTHERS OF ASTHMATIC CHILDREN. V.A. Revyakina, I.I. Balabolkin, L.S. Namazova, N.I. Voznesenskaya. Institute of Pediatrics, RAMS, Lomonosovsky prosp, 2/62, Moscow, Russia.

An Asthma-school was organized in the Department of Allergology and intended for mothers with a child suffering from bronchial asthma. The educational program included 14 lessons. In classes we provided mothers with information concerning causative factors of bronchial asthma and its pathogenesis, with special attention to first emergency nursing during an attack and modern prophylactic measures. We carried out 6 cycles of lessons attended by 74 mothers. During the lessons, we found that 72.7% of mothers believed bronchial asthma to be a temporary condition disappearing with age. None of mothers knew approaches for control of disease signs and symptoms. Most of the mothers had insufficient knowledge about the introduction of broncholytics and peak-flow-meter usage. By the end of the classes, 90.9% of mothers gave correct answers to our questions. We believe that organization of pediatric Asthma-schools allows to elevate effectiveness of treatment of bronchial asthma in children.

INCIDENCE OF SENSITIZATIONS DURING CHILDHOOD ASTHMA. F. Rancé, A. Juchet, F. Brémont, G. Dutau. Service de Pneumologie et Allergologie Pédiatrique, CHU Purpan, 31059 Toulouse.

The rise in prevalence of infantile asthma is encompassed in a global rise in manifestations of hypersensitivity whether it be eczema, allergic rhinitis or alimentary allergies. Explanations for these tendencies are multiple: genetic, linked to allergen exposure and also to non-specific factors such as viral infections and passive tabagism. Our study is aimed at illustrating through numerical data the importance and evolution with age of sensitizations during the course of childhood asthma. A retrospective study was performed of case files of children admitted to day hospitals during 1995 for asthma evaluation. The diagnosis for asthma was retained on the existence of at least 3 episodes of wheezing. Family antecedents, total IgE, respiratory function (VEMS or Vmax CRF) were evaluated. Sensitization was defined by positivity to a prick-test (≥ 3 mm and > to 50% of positive control) and/or specific serum IgE assay (≥ class 2. DPC Behring diagnostic). Other tests were performed based on clinical context: radiological and immunological. Statistical analysis was performed using the chi-squared test. The investigation involved 134 children, 72 boys and 62 girls (sex ratio 1.16), average age of 4 years 5 months (7 months to 15 years). The mean age of the first asthmatic manifestation was 1 year 6 months (1 month to 9 years). A first degree family atopy was detected in 67% of cases. Sampling was divided into 3 groups based on age: group 1) 39 children aged 7 to 24 months (29%); group 2) 63 children aged 2 to 6 years (47%) and group 3) 32 children above 6 years old (23.8%). The mean total IgE was 24 UI/ml for group 1, 132 UI/ml for group 2 and 346 UI/ml for group 3. Functional respiratory testing detected an obstructive syndrome (VEMS < 82% or Vmax CRF < 100 ml) in 50% of cases in group 1, 17% of cases in group 2 and 16% of cases in group 3 ($p < 05$). A respiratory and/or food sensitization was evidenced in 16.3% of cases in group 1, 28.5% of cases in group 2 and 56.2% in group 3 ($p < 05$). Beta 2-mimetics are used on demand in 46.2% of cases, inhaled corticoids in 44% of cases, ketotifen in 5.2% of cases and sodium cromoglicate in 3.7% of cases. This constitutes

preliminary results for which an analysis on a larger scale will be presented. In definitive, younger children seem to have more severe asthma, older children are more often sensitized, even polysensitized and the joint utilization of cutaneous tests and biological assay improve sensitization screening.

EOSINOPHIL COUNTS IN BRONCHO ALVEOLAR LAVAGE FLUID IN ASTHMATIC CHILDREN. A. Charavel, S. Chaouat, M. Fayon, A. Grimfeld, J. Just. Department of Pulmonology, Armand-Trousseau Children's Hospital, Paris, France.

It is now admitted that airway inflammation plays a critical role in the pathogenesis of bronchial asthma and that an important role is allocated to eosinophils (PE) in this process. The aim of this study was to determine the bronchoalveolar lavage fluid (BALF) eosinophil count with respect to age, allergic status and severity of asthma. Patients and methods: A retrolective cohort comprised 73 asthmatic children (0-36 months(m): n = 41; > 36 m: n = 31); sex ratio (m:f = 1.4: 1). These patients underwent a bronchoscopy and a bronchoalveolar lavage (BAL). Allergic status took into account a familial history of allergy, a personal history of atopic dermatitis, positive skin tests and an increase in total and specific IgE serum levels. The number of PE was systematically determined in BALF of each patient. Results: We observed 1) a strong positive correlation between BALF eosinophil counts and age ($y = .026x \pm 0.26$, $p = 0.05$; $r = 0.349$); 2) a significant difference in BALF eosinophil counts between allergic and non allergic patients ($p = 0.0037$), and this was not influenced by age ($p = 0.3126$); 3) no significant correlation between BALF PE and severity of asthma ($y = 0.611x \pm 0.312$; $p = 0.44$; $r = 0.01$). Conclusion: The responsibility of PE in the pathophysiology of bronchial asthma appears to be age dependent. Thus, a high level of BALF eosinophils is more frequently observed in older children.

BACTERIAL PULMONARY INFECTION IN THE WHEEZY CHILD. M. Fayon, J. Just, A. Charavel, H. Vu Thien, A. Grimfeld. Departments of Pulmonology and Microbiology. Armand Trousseau Children's Hospital, Paris, France.

It is widely accepted that viral infections and bacterial upper respiratory tract infections can cause exacerbation of asthma symptoms. But it remains unclear whether the presence of bacteria in the lower respiratory tract (LRT) has similar effects. The aim of this study was to determine the incidence and profile of the bacterial flora of the LRTI in asthmatic children and to identify risk markers for such infections. LRTI was defined by a bacterial count more than 10^5 CFU/ml. Subjects and methods: 273 consecutively-investigated physician-diagnosed asthmatic children were studied. Bacterial samples were obtained via flexible bronchoscopy +/- bronchoalveolar lavage. Criteria for bronchoscopy were classical. No intubated patients were included. Results: Mean (SD) and median age of patients were 32.2 (38.3) and 17.5 mo., respectively. The incidence of positive bacterial cultures was 12.1% (33/273 patients). Bacterial flora comprised *Haemophilus influenzae* (39.5%, 15/38), *Branhamella catarrhalis* (23.7%, 9/38), *Neisseria species* (7.9%, 3/38), *Mycoplasma pneumoniae* (7.9%, 3/38), *Pseudomonas non-aeruginosa* (5.3%,2/38) and *Pseudomonas aeruginosa* (2.6%, 1/38). No clinical or radiological markers were significantly associated with LTR bacterial infection. Conclusion: These results suggest that bacterial superinfection may play a role in the inflammatory process of the bronchial asthma in children. Moreover, we speculate that besides current antiinflammatory treatments, antibiotics likely have the potential to limit asthmatic symptoms in a significant number of young patients.

EFFECT OF A NOVEL ANTI-INFLAMMATORY AGENT, SDZ IMM 125, ON ALLERGEN-INDUCED INFLAMMATORY CELL INFLUX INTO THE AIRWAYS OF ACTIVELY SENSITIZED BROWN-NORWAY RATS. KI Hoshiko, N Nakamaru, K Kitagaki, T Totsuka, S Hayashi. Sandoz Tsukuba Research Institute, 8 Ohkubo. Tsukuba-shi Ibaraki, 300-33, Japan.

The anti-inflammatory effect of SDZ IMM 125, cyclosporin analogue of a selective T-cell inhibitor, on the airway was investigated via inhalation route of administration. Male Brown-Norway rats were actively sensitized with ovalbumin. Single inhalation of SDZ IMM 125 was performed 18 hours prior to allergen challenge to define the dose-dependent effect. In order to define the time-course effect, SDZ IMM 125 was inhaled either 1,3,6 or 24 hours prior to, and 24 hours after challenge. For the multiple inhalation study, SDZ IMM 125 was given by inhalation to the rats for 10 successive days prior to and 24 hours following challenge. Broncho-alveolar lavage was performed 48 hours after challenge. Single inhalation of SDZ IMM 125 (0.3-3.0 mg/kg in the airways: ID_{50} = 0.32 mg/kg) significantly inhibited allergen-induced eosinophil influx into the broncho-alveolar lavage fluid in a dose-dependent manner. Similar inhibition was induced by inhaled cyclosporin at higher doses (0.3-3.0 mg/kg in the airways: ID_{50} = 0.75 mg/kg). From the time-course experiment, inhaled SDZ IMM 125 (1.8 mg/kg in the airways) was effective on eosinophil accumulation even 24 hours prior to challenge. Following multiple inhalation of SDZ IMM 125, the number of eosinophils in broncho-alveolar lavage fluid was significantly reduced (0.13 mg/kg in the airways), being about a half of that after single dosing. The data suggest that inhaled SDZ IMM 125 elicits long-term inhibitory effect on eosinophil influx in asthma.

RANDOMIZED TRIAL OF SALBUTAMOL IN ACUTE BRONCHIOLITIS. F. Souhail, B. Slaoui, B. Bouharrou, R. Chami, F. Dehbi. Pédiatrie II- Hôpital d'enfants Ch Ibn Rochd Casablanca, Maroc.

To test whether nebulized salbutamol is safe and efficacious for the treatment of young children with mild acute bronchiolitis, we enrolled thirty children (median age 6 months, range 1 to 24 months) in a control trial. Patients received two treatments at 30 minute intervals of either nebulized salbutamol (0.03 ml/kg) or a similar volume of normal saline solution placebo. Outcome measures were respiratory rates, a clinical score based on the degree of wheezing and retractions. Patients in the salbutamol group exhibited significantly greater improvements in respiratory rates, accessory muscle score, and wheezing score. VRS was identified in 78% of the children tested. We conclude that salbutamol is safe and effective for the initial treatment of young children with acute bronchiolitis

THEOPHYLLINE THERAPY IN BRONCHIOLITIS. F. Khaldi, H. Boushaba, M. Dargouth. Hôpital d'Enfants, Bab Sâadoun, Jebari 1007 Tunis, Tunisia.

Infants admitted to hospital with acute bronchiolitis often have respiratory failure. Optimal therapy remains controversial. To test whether intravenous theophylline with or without intravenous hydrocortisone is efficacious for the treatment of young children with acute bronchiolitis, we enrolled 58 children (age = 8.7 ± 5.6 months) a randomized clinical trial. The following criteria in care selection were used: 1. expiratory wheezing of acute onset; 2. age of 24 months or younger; 3. signs of vital respiratory illness; 4. with respiratory distress at the first episode. Patients received symptomatic treatment (oxygen, hydration physiotherapy) or symptomatic treatment with intravenous theophylline every 8 hours (5 mg/kg) or symptomatic treatment with intravenous theophylline every 8 hours and intravenous hydrocortisone (5 mg/kg). Outcome measures were respiratory rate, heart rate, degree wheezing and retractions and duration of hospitalization. There were no significant differences between the patients who received theophylline therapy alone, those who received both theophylline and steroids and those who received symptomatic treatment. We conclude that adequate hydration, oxygenation and treatment of complications are the foundation of good care.

BRONCHIOLITIS, LUNG FUNCTION AND RESPONSE TO SALBUTAMOL IN ACUTE PERIOD AND IN EARLY CONVALESCENCE. P. Le Roux, I. Lebeurier, P. Gatel, C. Morin, B. Le Luyer. Department of Pediatrics, Centre Hospitalier, BP 24 FR - 76083 Le Havre Cedex.

Efficacy of salbutamol in the management of bronchiolitis has been much debated. Many publications showed an improvement on clinical parameters with bronchodilator (BD) in bronchiolitis. The aim of our study was to evaluate the BD effects in acute respiratory syncytial virus (RSV) bronchiolitis and at the beginning of convalescence, and to detect infants early with asthma. Subjects: We evaluated 11 infants between Nov. 94 and Feb. 95 (7 boys, 4 girls) mean age: 6.61 months ± 10.5. Respiratory function was assessed a first time at the end of hospitalization and a second time one month later. Measurements of lung function were obtained on infants sleeping after oral administration of chloral hydrate (75 mg/kg). Lung functions were measured with tidal flow-volume loops (Sensor Medics 2600®) before and 20 mn after salbutamol (200 meg spacer, Babyhaler Glaxo®). The data were compared with Student's t test. Results: In acute phase, no significant changes occurred in lung function after salbutanol: Crs=1.26 mL/Cm H_20/kg before, versus 1.22 after; Rrs= 0.05 cm H_20/mL/s (no change); (PTEF/tB=0.16 (no change) VPTEF/VE=0.23 (no change); PTEF=134.73 mL/s versus 141; TEF25/PTEF=0.55 versus 0.50 and CRF=23.72 ml/kg

versus 23.16. In the convalescence period, we showed a significant improvement of Rrs 0.05 before; 0.04 after salbutamol ($p < 0.05$, less 20%); PTEF (116.95 versus 137.61 + 17%) and VPTEF/VE (+ 15%). The comparison between the first and second measurements showed a significant decrease of basal measurement for PTEF (134.73 at first versus 116.95) and for the VPTEF/VE ratio (0.23 versus 0.20) ($p < 0.05$). Conclusion: In our study, we did not show efficacy of salbutamol in the management of RSV bronchiolitis on lung function at the acute period. In the convalescence period, bronchodilators were found most effective. Tidal flow volume loops after acute period of bronchiolitis may possibly predict asthma in infants. It would be interesting to test inhaled corticoids in future RSV bronchiolitis.

A FIVE YEAR SURVEY OF RESPIRATORY SYNCYTIAL VIRUS INFECTIONS IN OUTPATIENTS. M. Aymard[1], B. Lina[1], D. Thouvenot[1], J. Luciani[2], J. Stagnara[2] and the participants of the GROG network. [1]Laboratory of virology, National Influenza Reference Centre, CHU de Lyon, France; [2]General Practitioners and Pediatricians, Rhône-Alpes, France

The incidence of RSV in respiratory diseases observed in outpatients is less known than in hospitals. To evaluate its pathogenic role in community-acquired respiratory diseases, a network of surveillance is required. Such a network is already established in Rhône-Alpes, France since 1987, for the detection and isolation of Influenza strains. This network (Groupe Régional D'Observation de la Grippe or GROG) includes 50 general practitioners and 25 pediatricians and collects nasal swabs each year from October to April in patients suffering of an influenza-like disease (ILD). These swabs also allow detection and/or cultivation of respiratory viruses such as RSV, adenovirus, parainfluenza, rhinovirus and coronavirus. RSV was detected in clinical samples by an immunofluorescent assay or an ELISA test. During the last five years, 6254 swabs were collected, allowing to detect 367 isolates (annual mean: 73.4, range: 52-117). During each surveillance, a peak of isolation of RSV was clearly identified, varying in starting time, duration and intensity. During these peaks, RSV represented up to 68.5% of the isolates recovered from the swabs during a week. In pediatric practice, during the peak of incidence, RSV was detected in up to 30% of the samples. As for influenza, the variation in the percentage of positive swabs was well correlated to the criteria ILD/practician/week, but mostly to the number of bronchiolitis per ILD observed. In general practice, RSV infections were mainly detected in children below 5 years (77%), but were also observed in adults over 20 (14.2%). In outpatients, the more frequently reported clinical symptoms related to an RSV infection were: mild fever, clear nasal secretion, cough associated to bronchiolitis, but no or rare general symptoms such as headache, myalgia or asthenia. As other respiratory viruses were co-circulating, 5% of the RSV isolates were associated with other viruses (influenza, coronavirus, rhinovirus, adenovirus). The outpatients epidemic periods were compared to those occurring in hospital during the last 5 years. They did not regularly occur at the same time. During the last five years, the GROG was a satisfactory alert network for RSV, even if it was not specifically established for its surveillance. It allowed the comparison of successive annual epidemics. It could be of use for both implementation and evaluation of preventive therapy. Nevertheless, it would be necessary to fulfill epidemiological requirements as determining the denominator and the representativity of the sampling.

CHRONIC DISEASES OF UPPER SECTIONS OF GASTRO-INTESTINAL TRACT IN BRONCHIAL ASTHMA PATIENTS. Ye.V. Klymanskaya, A.Ya. Shershevskaya, S.E. Edrees, Ye.M. Taberovskaya. Infant disease clinic under the Moscow Medical Academy named after I.M. Setchenov; B Pyrogovskaya 19, Moscow, 119435, Russia.

Recently, the increased frequency of combined course of bronchial asthma (BA) and chronic gastrointestinal disease has been noticed. Numerous aspects of this problem still remain scarcely studied (non-solved). This work is aimed at estimating the results of clinico-endoscopic and morphological research as well as the discovery of specificity in the course of gastroduodenal pathologies in BA patients. Ninety-eight patients with bronchial asthma aged from 4 to 14 years have been studied; at the period of attacks as well as at the time following the attacks, there were 63 patients studied, thirty-five children were examined between the attacks. Family history in 32.6 percent had been aggravated with gastrointestinal diseases, 24.4 percent had had concomitant illnesses such as atopic dermatitis and repeated Qwinkae edemas. In 68.6 percent of the patients, there had been repeated pains of various intensity in the abdomen and locations not always combined with dyspepsia complaints. Esophagogastroduodenoscopy had shown acute erosions and ulcers localized in the pyloro-duodenum in 19.4%, exacerbation of BA in 23.8% of patients and remissions in 11.4%. The disturbance of motor-evacuative function of the stomach was observed in 38.7% of the patients examined. In 79.6% of the children, active gastritis and/or gastroduodenitis has been diagnosed. Morphological studies of stomach biopsies mucous membrane and duodenum was performed in 42 out of 98 patients. Histological signs of light and heavy degrees was associated with haelycobacteria in 63.3% of cases as well as an increase in eosinophils and fat cells in their own plate and epithelium. The relationship between degranulated and granulated cells in stomach body has been found equal to 0.44, in antrum - 0.31, in duodenum - 0.95. There was an increase in the general number of IgE, IgG, IgA producing cells. This research proves in favor of serious disturbances in BA patients with stomach and duodenum more marked at BA exacerbation. The disturbances genesis is connected with both infectious and immune mechanisms. The latent course of gastroduodenitis in 1/3 of the patients determines the necessity of instrumental examination of stomach and duodenum.

GASTROESOPHAGEAL REFLUX (GER) AND ASTHMA IN INFANCY. A REPORT OF 100 CASES. T.S. Benchekroun, M. Jorio, B.S. Benjelloun, L. Harim, C. Mahraoui, A. Hassani. Hôpital des Enfants, Rabat Maroc.

The purpose of this work was to determine the influence of gastroesophageal reflux (GER) in asthma syndrome. We report 100 pediatric cases of asthma and GER, 57 males and 43 females with median age 63 months (range 16-132). Among the signs suggesting GER, vomiting was found in 48 cases, cough in 23 cases, a focus of medium lobe in 11 cases and severe hypotrophy in one case. GER was detected by barium swallowing in 87 patients and diagnosed by pH monitoring in 13 patients. This exploration was completed by fiberoptic endoscopy in 29 children and in no case was esophagitis visualized. Asthma was severe in 50 cases, familial atopy was seen in 54 patients, 11 of them had a positive allergic test. Every patient had medical antireflux treatment. Corticotherapy was prescribed in 34 cases. Six children underwent antireflux surgery. GER and asthma were considered as a coincidental association in 45 cases, GER apparently had a worsening effect on asthma in 45 cases and was of definite significance for respiratory symptoms in 10 cases. This critical study was mandatory in every patient in order to determine therapeutic indications.

PULMONARY EFFECTS OF INHALED BECLOMETHASONE DIPROPIONATE AFTER THE ACUTE PHASE OF BRONCHIOLITIS IN INFANTS. N. Montaud*, M.D. Donnou**, E. Girin**, E. Deroeux**, M. Bellet**, L. De Parseau*. *Département de Pédiatrie, CHU Morvan, Brest, France; **Unité d'Explorations fonctionnelles respiratoires, CHU Morvan et Laboratoire de Physiologie, Faculté de médecine, Brest, France.

Bronchiolitis may initiate a chronic obstructive pathology. Risk factors include very young age, and previous bronchopulmonary dysplasia. To test the preventive effect of inhaled beclomethasone dipropionate (500µg/day), 19 infants were treated for 2 months after an acute phase of bronchiolitis. Salbutamol (200µg/day) was associated when β2-agonist responsiveness was positive. This treatment was decided because of the young age (< 3 months, 17 cases) or history of hyaline membrane disease and bronchopulmonary dysplasia (2 cases). Pulmonary function was studied 3.25 ± 1,25 months after the acute phase using a sensor medics 2600 device. Infant sleep was induced by chloral hydrate (60-80 mg/kg). Pulmonary function was associated by total respiratory resistance (Rrs), compliance (Cms), functional residual capacity (CRF), and partial expiratory flow volumes curves (PEFV). The maximal flow measured at CRF (VmaxCRF), considered to be the best indicator of small airways obstruction, ranged from 29% to 123% (76 ± 41%) compared to reference values in the literature. In a comparable group of infants, Caswell found lower values of VmaxCRF (26 ± 14%) after a 9-week treatment and so did Maayan after a 2 week treatment (42 ± 13,2%). This preliminary study in an infant group with a high risk of bronchopulmonary sequels, though without placebo control group, seems to show a positive effect of inhaled steroid treatment after a bronchiolitis. It could improve the level of residual airway obstruction and possibly decrease the risk of delayed bronchopulmonary sequels.

RESPIRATORY PROBLEMS TWO YEARS AFTER ACUTE BRONCHIOLITIS IN INFANCY. A. Abid, B. Slaoui, M. Bouskraoui. Service de Pédiatrie 4 et Pédiatrie 2, Hôpital d'Enfants, Casablanca, Maroc.

The relationship between bronchiolitis and asthma is now well established. Several prospectives studies have shown an important risk of recurrent wheezing after bronchiolitis during early childhood and infancy. Other studies have documented a high prevalence of normal pulmonary function after bronchiolitis. In order to clarify this important relationship, we have prospectively evaluated the clinical progress of 27 infants two years after admission to hospital with acute bronchiolitis. During the two-year follow-up period, 15 infants (55%) had 2 or more recurrences of dyspnea with wheezing, 3 presented one recurrence of wheezing, 3 had chronic bronchopulmonary symptoms including cough and airway obstruction and 6 infants were asymptomatic. These results agree with many prospective studies in children with bronchiolitis which show a prevalence of recurrent wheezing on the order of 50 to 75%. Three points appeared determinant to predict recurrent wheezing: a family or personal history of atopy, passive smoking and elevated serum IgE value. Prevention is primordial in these infants: avoidance of allergens, elimination of passive smoking and prevention of virus infection.

GASTROESOPHAGEAL REFLUX AND FUNCTIONAL CONDITION OF RESPIRATORY SYSTEM. L.A. Kobaladze, M.S. Manjavidze. State Medical University, Tbilisi, Republic of Georgia.

Great importance is attached to gastroesophageal reflux (GER) in development of broncho-pulmonary pathology (BPP), but in spite of a great number of investigations, etiopathogenetic aspects and tactics of therapy are not yet specified. The aim of the present work was the definition of functional conditions of respiratory system (RS) in children with GER on the early stages of development of BPP, determination of character of disturbances of RS in the case of GER and mechanisms of development of these disturbances. 115 children aged 5-15 were investigated. 75 of them (50 children with GER and 25 without) had a pathology of the gastrointestinal tract (gastritis and gastroduodenitis chronica) along with 40 practically healthy children of the same age as controls. Functional condition of RS was investigated by spiroanalyzer (Japanese firm "Fukuda Sangyo"), microaspiration was defined by the method of Wanager et al. (1980). It was determined for the first time that changes of RS in children with GER, in the early stages of development of BPP, have functional, transitional character, which is proven by the disappearance of these changes after dosaged physical load or/and treatment; changes of external breathing function in children do not depend on the degree of GER; presence or absence of microaspiration is not connected with the degree of GER and does not influence the functional conditions of RS; in the early stage, disturbances of RS are expressed by increased bronchoreactivity and decreased passage ability of small bronchi. Thus, early diagnosis and treatment of GER is an effective prophylactic method against development of respiratory pathology in children.

GASTROESOPHAGEAL REFLUX (GER) AS A CAUSE OF BRONCHIECTASIS IN CHILDREN. P. Willigens, P. Ahrens, S. Zielen, D. Hofmann. Dept. of Pediatrics, J.W. Goethe-University, Frankfurt/Main, Germany.

The relationship between GER and respiratory disorders has raised controversy since years. Problems in clinical work and diagnosis result from the great variability of pulmonary symptoms, including chronic cough, intrinsic bronchial asthma, recurrent obstructive bronchitis and pneumonia, bronchiectasis and "near miss" sudden infant death syndrome with recurrent apnea. An additional problem in diagnosis is that the great majority of children with respiratory complaints show no gastrointestinal symptoms (silent GER). We report about 17 pediatric patients, aged 3 to 18 years, with recurrent respiratory problems. After clinical examination and chest X-ray, all patients were suspected of suffering from bronchiectasis. After a basic diagnosis, we could exclude cystic fibrosis, tuberculosis, immotile cilia syndrome, alpha-1-antitrypsin deficiency, allergic asthma and immunodeficiency. With the support of extended pulmonological diagnosis - including barium swallowing examination, 24-hour esophageal two-level pH monitoring, bronchoscopy with bronchoalveolar lavage and investigation for the presence of lipid- and carbon-laden alveolar macrophages, further esophagogastroscopy with biopsy and at least high resolution computer tomography, we could diagnose a pulmonal relevant GER as a cause of bronchiectasis in all patients. Results and correlation of the different diagnostical methods will be reported.

ESOPHAGEAL MOTILITY IN CHILDREN WITH GASTRO-ESOPHAGEAL REFLUX AND RESPIRATORY SYMPTOMS. G. Cordeiro Ferreira, L. Espinosa. Gastroenterology Unit - Hospital Dona Estefânia, Lisbon, Portugal.

The association between Gastroesophageal Reflux (GER) and chronic or recurrent respiratory symptoms is common in children, but the mechanisms underlying their putative cause and effect relationship remain controversial. In order to detect specific patterns of esophageal dismotility in these children, we studied by esophageal manometry a group (Group A) of 39 patients (mean age : 1.2 years) presenting GER and respiratory symptoms : recurrent wheezing - 26; apnea spells - 7; chronic pulmonary aspiration - 4; chronic stridor - 2, and compared them with a group (Group B) of 22 patients (mean age : 4.2 years) with GER but no respiratory complaints. Manometric evaluation was performed with quadruple lumen catheter perfused at a rate of 0,5 ml/min. by a pneumo-hydraulic capillary system. Pressures were registered by extraluminal transducers (Medex MX 860) and recorded by a multichanneled polygraph (Synetics). Motility of the esophageal body, resting pressure, position and relaxation of Lower Esophageal Sphincter (LOS) and Upper Esophageal Sphincter (UOS) and coordination between pharyngeal contraction and UOS relaxation were analyzed. Significant differences were found in relation to 3 parameters: position of the LOS (mainly intrathoracic in group B), resting pressure of the UOS (Group A: 51.3±15.6 mmHg; Group B: 61.81±17.3 mmHg; $p<0,02$) and incoordination between pharyngeal contraction and UOS relaxation (Group A : 11 patients; Group B : 0 patients; $p<0,001$). In the presence of acidification of the proximal esophagus, the UOS raised its resting pressure. The lower pressure in patients of Group A, suggests an absence of such a response, exposing their respiratory tree more easily to microaspiration of refluxed material. Another mechanism involved is the incoordination between pharyngeal contraction and UOS relaxation facilitating the aspiration of swallowed or refluxed contents.

CAUSAL FACTORS AND THE DIFFICULTIES IN ADMINISTERING THERAPY IN INFANTS WITH WHEEZY BRONCHITIS. M. Kaczmarski, J. Semiuk, D. Korol. IIId Department of Pediatrics, Bialystok Medical School, Poland.

The aim of this clinical study was to determine whether there was a causal link between defined recurrent or long-lasting pathological symptoms of the respiratory system, the harmful effects of consumption of certain foods by children and/or existing gastroesophageal reflux (GER). This study was performed on 40 children aged 4 to 13 months old. Before admission to the Clinic, all the children demonstrated respiratory system ailments manifested in the form of wheezy bronchitis without febrile reaction. These children were given antibiotic therapy many times previously. Taking into account the following data of the child's medical history, physical examination, additional laboratory tests, allergy tests and tests confirming the presence of GER, it was found that in 25 (62.5%) investigated children, food allergy and/or GER were confirmed to be the etiopathogenetic factors which, when isolated or combined, caused the onset of the observed wheezy bronchitis. After a minimum 6 to 8 weeks of eliminating harmful products from the child's diet (i.e. milk and dairy products -76%, citrus -12%, eggs - 10%), combined with antihistaminic drug administration and/or anti-reflux therapy, the elimination of disease symptoms occurred in 54% of investigated patients and an alleviation of symptoms and their chronic character was observed in the remaining 46%.

ROLE OF PNEUMOCOCCUS PNEUMONIAE AND HAEMOPHILUS INFLEUZAE INFECTIONS IN CF PATIENTS. L. Jelenina, L. Vishnjakova, T. Guembitskaia. CF Center, State Research Centre for Pulmonology Sankt-Petersburg, Russia.

We analyzed the results of the observation and treatment of 156 CF patients during 10 years. The role of S. pneumonia and H. influenza in CF pathogenesis has been insufficiently studied. The infectious process was polyetiological in the main group of our patients. Pneumococcus infection was revealed in 75% children and 86.2% adult patients. A high level of local immunity and strict return dynamics of systemic immunity showed the prevalence of acute forms of this infection in children. High frequency isolation and stable high level anti-pneumococcal antibodies in serum of adults suggests the formation of chronic infection of this etiology. H. influenza was found in 52% of the children and 65% of adults. Low level humoral immunity was established in 30% CF children only. However, a high level of system immunity was observed in 1/2 adult patients. H. influenza and S. pneumonia are involved in pulmonary infections during the whole life of CF patients but their role as the only pathogens is reduced with aging of the patient since it was established in 21.9% of children and only in 3.4% of adults. These bacteria play a triggering role in the onset of infection and its aggravation. Moreover,

they possess a series of pathogenic factors including the ability to stimulate mucine formation, destroy ciliary mechanism of respiratory airway mucous membrane, synthesize histamine and also have elastase and cytolytic activity. These and other actors of pathogenicity promote the progression of the disease.

RESTING ENERGY EXPENDITURE (REE) AND SUBSTRATE OXIDATION RATES IN CYSTIC FIBROSIS (CF) PATIENTS (PTS) WITH DIFFERENT CLINICAL PICTURE. M. Antonelli, S. Zullo, S. Bertasi, S. Quattrucci, G. Cimino. Cystic Fibrosis Center, Dep. Pediatrics. University of Rome "La Sapienza" Rome, Italy.

The aim of the present study was to determine the REE and substrate oxidation rates in CF and to relate these to clinical picture, severity of the disease, and dietary intake. Twenty seven CF pts, divided into three groups : A) Nine pancreas sufficient (PS) pts (6 males); B) Nine pancreas insufficient (PI) with mild chest disease (6 males); C) Nine pts with severe (PI+SLD) lung disease (7 males) were studied. REE was measured through indirect calorimetry with a Deltatrac metabolic monitor (Datex Instr. Corp.). 0_2 consumption and CO_2 production were calculated at 1 m. intervals and graphically recorded together with rates of oxidation of fat, protein and carbohydrate calculated using the Harris-Benedict formula. Nutrient intake and its composition was estimated in a 3 day dietary recall. All pts were on an hypercaloric fat free diet (111-119% of RDA 55+5 fat, 49+3 carbohy. 15+1 prot). Mean weight of pts in groups A and B resulted within normal values (56⌀C and 48⌀C respectively while those in gr. C were undernourished (3⌀C). Only measured REE values of group A were within normal values (+10%) of predicted, while PI pts and especially those with severe chest disease (PI+SLD) were hypermetabolic.

Groups	pts	mean age	REE	pred.	%	Fat	Carb	prot
A) PS	9	17	1582	1492	6%	53%	30%	17%
B) PI	9	21	1700	1484	15%	41%	41%	18%
C) PI+SLD	9	18	1717	1426	21%	31%	53%	16%

The mean oxidation rate of carbohydrates was much greater in group C (53%) than in group B (41%) and particularly in group A (30%). The oxidation rate of proteins was similar for the three groups. The mean oxidation rate of fats was significantly reduced (31%) in group C. In all pts with severe lung disease, a greater proportion of REE is derived from carbohydrate oxidation. The increase of REE previously reported in CF has been confirmed only for pts with advanced chest disease.

PULMONARY MANIFESTATIONS IN CYSTIC FIBROSIS, THE EXPERIENCE OF THE FIRST PEDIATRIC DEPARTMENT IN CLUJ, ROMANIA. Mirela Filip, Paula Grigorescu-Sido, Zoa Nicoară, Carmencita Denas, P. Florescu.

Cystic fibrosis (CF) is one of the most frequent genetic metabolic diseases with a lethal course in the white race. Because course and survival are to a great extent conditioned by respiratory manifestations, the aim of the present study has been to make the evaluation both clinically and by using the available facilities of paraclinical investigation of these manifestations. The studies were carried out in 43 children (aged 1 month to 7 years) diagnosed in the clinic during the last 10 years: in 33 cases (76.7%) the diagnosis was made intravitam and in 10 children (23,3%) at necropsy. The diagnosis was made by correlation of the clinical, radiological, biohumoral, histological data and of the high level of chlorine in the sweat. The analysis of the results revealed: a) 55,8% of the cases presented respiratory symptoms from the onset of the disease, these occurring after: 1-3 months; 3 months - 1 year; 1-3 years and over 3 years in: 16,2%; 18,6%; 11,6% and 9,3% respectively; b) the respiratory symptoms consisted in: recurrent dry cough associated with wheezing - 41,6%, protracted productive cough - 25%, the clinical picture of recurrent pneumonia and bronchopneumonia - 25%, and other symptoms - 8,3%; c) the radiological changes were suggestive for the diagnosis in 50% of the cases, consisting in lobar atalectasis, diffuse emphysema, bronchiectasis and pneumothorax; d) the etiology of the investigated bronchial infection in 24 children showed the intravitam presence of hemolytic Staphylococcus aureus alone or associated with Klabsiella in 20 and 4 children respectively; necropsy revealed the presence of Pneudomonas, Proteus and Klabsiella bacilli in 4, 2 and 2 cases respectively; e) of the 33 cases diagnosed intravitam, 5 children died in the first two years, and in the next 3 years, 2 other children died; f) the anatomo-pathological examination revealed lesions of purulent bronchitis, pulmonary abscess, zones of dissecting emphysema and bronchopulmonary aspergylosis; g) in only 77,6% in the course of the disease, this was manifested by classical association.

RECURRING DISEASE OF THE LUNGS IN CHILD. L. Dahmani. Pediatric Department, Ksar-Hellal Hospital, 5070 Tunisia.

The recurring disease of the lungs (RDL) in child poses two problems: 1) etiology 2) specific treatment. The authors will draw etiologic and evolutionary profiles of their country. Methods used: Seventy-two observations of children with more than three episodes of recurring disease of the lungs by year was studied over a period of seven years. The RDL caused by congenital cardiopathy, otorhinolaryngologic affections and nutritional deficiency were eliminated. Results: There were 48 boys and 24 girls. The median age was 38 months. Among the numerous etiologies, asthma took first place (44%), gastroesophageal reflux (GER) constituted the second etiology (26%), bronchiectasies were found in 15% of cases. The other etiologies (15%) included lung malformations, aortal arch anomaly, IgA deficiency, etc. Conclusions: The early diagnosis and treatment of RDL in children can guarantee a best functional prognosis. Asthma and GER must be found systematically in our country.

FAILURE OF ANTIBIOTICS TO REDUCE ENDOBRONCHIAL INFLAMMATION IN CYSTIC FIBROSIS. D.Y. Koller, I. Nething, J. Otto, R. Urbanek, C. Wojnarowski, KR Herkner, I. Eichler. University Children's Hospital Vienna, Austria & Fachklinik Wangen, Germany.

Chronic bacterial infection supervenes with the development of an inflammatory reaction which is associated ultimately with extensive lung damage. Both activated neutrophils and eosinophils have been shown to play an important role in the inflammatory process in cystic fibrosis (CF). Myeloperoxidase (MPO) and eosinophil cationic protein (ECP) were considered as reliable markers of neutrophil and eosinophil activity, respectively. We thus investigated the change in inflammatory activity and lung function, before, during and after 2 weeks of antibiotic therapy. Sputum and serum samples were obtained on day 0, 4, 8, 12 and 15 in 23 CF patients (mean age: 13.0 years) and were used for determination of MPO and ECP as well as of interleukin (IL)-8 (activates neutrophils) and IL-5 (activates eosinophils). 32 healthy age-matched subjects were used as controls. Serum measurements demonstrated increased levels of ECP and MPO in CF patients compared with controls ($p<0.0001$). During antibiotic therapy ECP levels did not change significantly (median: 38.1 µg/L vs 34.8 µg/L) whereas MPO decreased significantly in serum (median : 568 µg/L vs 401 µg/L; $p<0.006$). Surprisingly, sputum MPO levels did not decrease throughout antibiotic treatment (median : 75 mg/L vs 98 mg/L). Very high levels of ECP in sputum were measured before and after antibiotic therapy (median: 1.18 mg/L vs 1.35 mg/L). In addition, no change of IL-8 or IL-5 was observed. IL-5 was detectable in CF patients with aspergillus sensitization only, but, surprisingly, there was a strong relationship between IL-8 and ECP sputum levels ($r=0.708$; $p<0.0001$). In conclusion, i.v. antimicrobial treatment partly reduces neutrophil activation in peripheral blood, but is unable to influence eosinophil activity in both serum and sputum as well as sputum MPO, IL-8 and IL-5 levels. These results may indicate the inefficacy of systemic antibiotics to reduce the pulmonary inflammatory process in cystic fibrosis and thus progressive lung tissue destruction. Therefore, antiinflammatory treatment modalities appear to be needed.

THE EFFICIENCY OF TIENAM ANTIBACTERIAL TREATMENT IN CYSTIC FIBROSIS PATIENTS BY BRONCHOALVEOLAR LAVAGE STUDY. L.A. Kronina, M.V. Samsonova, L.M. Voronina, A.G. Chuchalin, A.L. Chernyaev. Pulmonology Research Institute, 11th Parkovaya st., 32/61, 10577, Moscow, Russia.

The aim of our research was to use bronchoalveolar lavage fluid (BAL) to assess the efficiency of antibacterial treatment with Tienam (beta-laktame antibiotics) in patients with severe cystic fibrosis (CF). Six adults with lung form of CF aged 16 to 33 (mean age 20.67 ± 2.83), hospitalized with lung inflammation exacerbation, were treated with Tienam in daily doses of 50 mg/kg intravenously for 10 days. The pseudomonal infection was revealed microbiologically in diagnostical titers in all patients. All patients underwent bronchoalveolar lavage (BAL) before and after the treatment course. BAL was performed as previously described by BAL Task Group (1989). The evaluated total cell number and increased number of polymorphonuclear leukocytes were the evidence of high activity of the inflammatory process in lungs of CF patients. After a 10-day course of antibacterial treatment the number of neutrophils significantly fell from 88.5 to 30.5%; in contrast, the number of macrophages rose from 7.5 to 56.6% in BAL. The obtained results of BAL showed the high effectiveness of 10-day course of Tienam in CF adults with lung inflammation exacerbation.

PSEUDOMONAS AERUGINOSA SEPTICEMIA AND DEFICIT IN NEUTROPHIL CHEMOTAXIS IN A CHILD WITH CYSTIC FIBROSIS. E. Deneuville, A. Dabadie, P-Y. Donnio, J. Dassonville, M. Roussey. Centre de Soins de Mucoviscidose. CHR de Rennes. 35033 Rennes, France.

Bacterial colonization in CF is normally limited to the respiratory tract. No systemic infection is encountered with bronchial bacteria. We report the case of a 2 year old girl who presented a septicemia with Pseudomonas aeruginosa. CF diagnosis was made on two positive sweat tests and an homozygous ΔF508 mutation on gene analysis. She presented with fever (40°C), respiratory distress and hypoxemia (SaO_2=88%). Sputum sample and two blood cultures isolated the same P. aeruginosa. Clinical course improved with IV antibiotherapy (Ceflazidim + Tobramycin, 15 d.). Thereafter, chronic colonization with P. aeruginosa remained. Immunological tests, performed after recovery, showed a deficit in neutrophil chemotaxis (Response to fMLP: Patient=0,65/ Control=1,4; Serum complement: P=0,5 / C=1,75). Three years after this septicemia, P. aeruginosa antibodies were positive. No other systemic infection occurred. This case is, to our knowledge, the first report of a P. aeruginosa septicemia in a CF child. Pseudomonas aeruginosa septicemia has been reported in two CF adults with end stage pulmonary disease [1,2]. Increased susceptibility caused by diabetes mellitus, corticoid therapy and hemoptysis is suspected in these cases. An immune deficiency in neutrophil chemotaxis in our patient can explain this septicemia. Humoral immunity is normal with the development of P. aeruginosa antibodies which could have a protective effect against systemic infection from bronchial colonization.

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RHEOLOGICAL PROPERTIES OF BRONCHIAL SECRETIONS IN CHILDREN WITH CYSTIC FIBROSIS (CF). M.E. Faustova, L.A. Jelenina, H.K. Dotsenko. The State Research Centre for Pulmonology, St-Petersburg, Russia.

In CF patients, marked obstructive impairments of lung function are due first of all to changes in bronchial secretion. In 10 CF children aged 2 to 14 years carriers of homo- and heterozygous mutation ΔF508, with disease exacerbation, we studied sputum rheological properties, levels of sialic acids (SA) and protein, and sputum microbial flora. Rheological analyses were carried out on "Rheotester" (RAS, Russia). The method is based on the computer analysis of the thinning process of sputum capillary thread (Maxwell model for the elastico-viscous fluid). Monitoring was assessed by relaxation time (sec). Other investigations were performed using conventional methods. In patients with ΔF508 mutation, high rheological parameters were observed in most cases of moderate and severe disease course (0.88; 0.086-0.494 sec), but they correlated with high SA and protein levels in one third of patients only. Sputum microbial agents included P. aeruginosa, S. aureus, more rarely -S. pneumoniae and H. influenzae. In 4 patients, the principal agent was S. aureus. Rheological parameters were high (0.163±0.035 sec), with normal values of SA (124.5±48.3 U) and protein (3.75 g/l). Other patients had chronic P. aeruginosa infection. In this group, rheological values were lower (0.056±0.036 sec; P=0.05), with slightly increased SA (187.0±20.1 U; P<0.05) and protein(5.0±2.88 g/l; P>0.05). We have previously demonstrated the in vitro proteolytic effect of P. aeruginosa on sputum (Pulmonology/Rus/,1992:4). Therefore, sputum rheological properties in CF children could depend not only on genetically determined dyscrinia, but also on specific microbial agents in bronchial secretions.

TIMING OF BRONCHIAL ARTERY EMBOLIZATION FOR THE CONTROL OF HEMOPTYSIS IN CYSTIC FIBROSIS. M. Antonelli, G. Cimino, S. Bertasi, F.M. Salvatori. Cystic Fibrosis Center Department Pediatrics. University of Rome "La Sapienza", Rome, Italy.

Hemoptysis is a harmful complication of increasing frequency in adolescent and adult Cystic Fibrosis (CF) patients (pts). Its prevalence resulted in 18% in a series of 246 CF pts. Up to now bronchial artery embolization has been recommended only to control massive hemoptysis which heralds advanced lung disease and a poor prognosis. The aim of this study was the evaluation of the outcome of embolization after small versus massive hemoptysis. Study design: thirteen CF pts. (7 males - age 13 - 36 years) between 1990 and 1995 underwent bronchial artery embolization after small hemoptysis (6 pts, Group A); or massive (7 pts, Group B). In all 13 pts, the bleeding vessel was the right bronchial artery in the upper lobe; associated with left bronchial artery in the upper lobe (6 pts). Group A: all 6 pts did not present relapses of bleeding after a mean follow up of 20.3 months (range 14 - 48). In Group B: 6 out 7 pts required reembolization after a mean of 13 months (range 5-20). One pt died of massive hemoptysis after the third reembolization in an eight month period; 1 pt died from chest infection 3 months after embolization and another died after 5 months. Final remarks: precocious versus delayed embolization is more useful for: - prevention of recurrent/ massive hemoptysis, - early detection of vascular lesions, - reduction of frequency of chest infections, - enhancement of clinical control and pts compliance to therapy.

ADVANTAGES OF HOME INTRAVENOUS ANTIBIOTIC THERAPY (HIVAT) BY AN ELASTOMERIC RESERVOIR (INTERMATE®) IN CYSTIC FIBROSIS (CF). M. Antonelli, M. Pigna, A. Tontini, S. Quattrucci. CF Center - Pediatric Dept. University of Rome "La Sapienza", Rome, Italy.

CF patients (pts) need recurrent and prolonged courses of intravenous (i.v.) antibiotics requiring frequent hospital admissions with poor quality of life and increased risk of cross-infection. Growing improvements in i.v. devices and drug delivery systems have recently enhanced HIVAT in CF pts. An elastomeric infusion device (INTERMATE®) allows a constant infusion rate in any condition. Twenty-three courses of HIVAT by INTERMATE® + permanent peripheral i.v. access were performed in 17 CF pts with Pseudomonas respiratory exacerbation (13F, mean duration of treatments 13,2 days; range 7-28). Each course was compared with the previous closest HIVAT with similar i.v. antibiotics administered with traditional phleboclysis (phl) + i.v. cannula so that each pt acted as self-control. At the start and the end of each course, weight, sputum culture, FEV1, WBC, C-reactive protein, ERS and chest X ray were evaluated. Pts answered questions on technical problems of INTERMATE® use, peripheral i.v. access, side effects and quality of life. Results: Effectiveness: INTERMATE® was as effective as traditional phl with regard to improvement in blood and pulmonary parameters. 60% of pts had >1 i.v. cannula inserted x course as well as standard infusion. Safety: Skin reaction did not occur in any course when using INTERMATE® compared to 8,6% (2/23) observed with the ordinary infusion. No thrombophlebitis or allergic reactions were noted. Quality of life: All pts preferred this type of treatment for improved quality of life, more free time and consequent better compliance to treatment. Costs: INTERMATE® is more expensive than traditional treatment. The major cost must be weighed versus the advantage of receiving HIVAT without interference with work, school attendance and reduced social concern. In conclusion the main advantages of INTERMATE® compared with phl at home were: more safety, constant infusion rate, easy handling, better compliance, less familiar anxiety, easier school or work attendance.

SILASTIC CATHETERS FOR INTRAVENOUS ANTIBIOTIC THERAPY IN PATIENTS WITH CYSTIC FIBROSIS (CF). Christian Buck, Anna Wolf. University of Ulm, Department of Pediatrics, Prittwitzstrasse 43, 89075 Ulm, Germany.

Repeated 14 day courses of intravenous (i.v.) antibiotic therapy is a currently accepted treatment in chronic Pseudomonas aeruginosa (PA) colonized CF patients. Antibiotics have led to an improved prognosis but they can cause frequent problems with venous access. Conventional intravenous cannula for giving i.v. antibiotics often have a short line life with frequent numbers of venipunctures. Therefore we used silastic catheters as a peripheral catheter. Silastic catheters (Fa. Vygon, Aachen, Germany; 15 cm, 0.6 mm diameter) were inserted 10 cm into a cubital vein in 16 patients with CF (age 7-28 years). 15 patients with PA infection received a combination of cephalosporins 2-3x/day and aminoglycosides 1x/day for a 14-day course. One patient received teicoplanin 1x/day because of methicillin resistant staphylococcus aureus. Between the antibiotic dosage the catheter was blocked with 200 U heparin (2ml Vetren®). In all patients a home antibiotic treatment was performed. In 15/16 patients, the silastic catheter could be continuously used for 14 days. No thrombophlebitis or other side effects occurred. In the patient who received antibiotics only 1x/day, the catheter occluded after 4 days. All these patients had received at least one 14 day antibiotic course beforehand. In none of these patients the conventional cannula could be maintained for 14 days. The mean life of conventional cannula for all patients was 4 days. Because of the long line life and easy handling, we conclude that the silastic catheter is an ideal alternative of venous access to perform home antibiotic therapy for patients with CF.

USE OF TOTALLY IMPLANTABLE VENOUS ACCESS DEVICES IN C.F. PATIENTS: EXPERIENCE OF C.F. BRETON MEDICAL CLUB IN 111 CASES. V. David[1], M. Jéhanne[2], G. Rault[2], V. Storni[2], M.R. Munck[3], M. Roussey[4], A. Dabadie[4], V. Moisan-Petit[5], C. Chaboche[6], M.T. Boguais[7]. ([1]CHU Nantes, [2]CHM Roscoff, [3]CHU Brest, [4]CHU Rennes, [5]CHG Vannes, [6]CHG Quimper, [7]CHG Saint-Brieuc).

Totally implantable venous devices (VAD) have gained acceptance as an adjunct in the treatment of cystic fibrosis (CF) patients who require repeated courses of intravenous antibiotics. In order to study the acceptance and tolerance of these VAD, a survey has been realized with a list of questions for the members of the CF breton medical club in charge of about 300 CF patients in this area. Meaningful data were collected from 111 VAD involving 78 patients (45 females, 33 males) who were followed in Roscoff (52 VAD, 36 patients), Brest (18, 12), Nantes (24, 13), Rennes (8, 8), Vannes (6, 6), Quimper (2, 2) and Saint-Brieuc (1, 1). Mean age at the insertion of the first VAD was 13 y (range 3-29); the length of time since the first intravenous course was 3 y; when the first VAD was inserted, 68 patients were contaminated with Pseudomonas aeruginosa. The VAD implantations were done under complete anesthesia (n = 100) or under local anesthesia (n = 11). Subcutaneous port was inserted in the prethoracic subclavian area (n = 93) or the anterior area of the forearm (n = 18). Access to the port was performed via a needle, changed, during the antibiotic courses, every 5 to 7 days. During the courses, the VADs were flushed after each use with 5 to 30 ml of Ringer solution and 50 to 500 IU of heparin; between the antibiotics courses, heparin flushing was performed every 3 to 4 weeks with 200 to 500 IU heparin in 5 to 20 ml of Ringer solution. In 27 cases, the VAD was also used for other indications beside antibiotic courses, essentially blood sample withdrawal. At the time of the study, 93 WADs were still functioning, 58 VAD had been removed because of unrelated catheter events (17%): death (n = 12) transplantation (n = 7) or related catheter events (33%) septicemia (n = 10) thrombose (n = 22) fissuring of the catheter (n = 4).

URSODEOXYCHOLIC ACID TREATMENT IN CHOLESTATIC LIVER DISEASE OF CYSTIC FIBROSIS PATIENTS: AN 18-MONTH PROSPECTIVE STUDY. K. Dieckmann, C. Maurage, S. Marchand, T. Petit, J.C. Rolland. CHU TOURS - 49 Bd Béranger - 37000 TOURS - France.

In the cystic fibrosis treatment center of Tours, France, 17 (21%) of 80 CF patients have cholestatic liver disease. 12 CF patients (8 males, 4 females) with cholestatic liver disease received 20mg/kg/d or ursodeoxycholic acid over 18 months or more in an open prospective study for evaluation of effectiveness and tolerance of UDCA treatment in CF liver disease. Data from each patient were compared before and after medical treatment. Mean age at inclusion was 10 years 6 months. Liver disease was determined by the presence of abnormal liver function tests (ALT>50IU/l, GT >40IU/L, biliary acids>10µmol/L) at 2 dosages over 2 months or more, or echographic or endoscopic signs of portal hypertension or presence of cirrhosis at liver biopsy. After 12-18 months of UDCA treatment, mean γGT levels decreased by an average of 50%, mean ALT levels decreased by an average of 47%. After 24 months of UDCA treatment, mean γGT levels decreased by an average of 67% and mean ALT levels by an average of 60% and mean biliary acids levels by an average of 31%. No significant changes in values of alkaline phosphatase, vitamin A and E levels were noted. Nutritional status, evaluated by measure of body weight and height, did not improve in our study. No clinical side effect was observed during the study period. UDCA may be an effective medical treatment in early stages of cystic fibrosis cholestatic liver disease.

COMPUTER BASED MONITORING OF LONG-TERM OXYGEN THERAPY AND NOCTURNAL DESATURATION IN OXYGEN DEPENDENT CYSTIC FIBROSIS PATIENTS. M. Antonelli, P. Canuzzi, S. Quattruci, S. Bertasi. Cystic Fibrosis Center, Department of Pediatrics, University of Rome "La Sapienza", Rome, ITALY.

Introduction-Home Oxygen therapy (O2TRP) monitoring in Cystic Fibrosis (CF) patients (PTS) needs frequent "Day Hospital" (DH) and unpredictable hospital admissions for reevaluation. Aim of the study: A tele-relief service of 0_2 pulse oximetry [Transcutaneous Oxygen Saturation-(TCO2S)], heart rate (HR) and 0_2 level in the Liquid 0_2 Tank (LO2T) for CF PTS in O2TRP was built. Study design: From March to October 1995, 5 hypoxemic CF PTS (3F, mean age 12±6 yr) from at least 1 year, were selected and enrolled on patient and family compliance. System components: Central Unit (CU) for 24 hours in-data collection and Peripheral Units: pulse oximeter, stationary LO2T reading system equipped for the control of 0_2 level in the LO2T; data (TCO2S, HR and 0_2 level) are stored in an "intelligent" unit connected with a modem. The system works in manual and automatic. (Nocturnal recording transmission of TCO2S to CU). Results:

PT	SEX	MONITORING MONTHS	N.TCO2S	N. 0_2 FLOW RESETS	N. ANTIBIOTIC COURSES
1	M	7	400	18	6
2	F	8	395	7	10
3	F	4	270	3	5
4	F	5	165	9	4
5	M	8	175	7	5

Comment: The system proved useful for early detection and precocious treatment of pulmonary exacerbations generally announced by marked nocturnal desaturations. The number of DH and hospital admissions for O2TRP monitoring was sharply reduced. It is very useful for the detection of 0_2 sleep desaturation and monitoring of O2TRP. The cost of 1 day of home O2TRP is markedly less expensive (10% per day) compared to 1 day of Hospital admission for 0_2 nocturnal monitoring (300.$).

NITROUS OXIDE IN OXYGEN VERSUS OXYGEN FOR PAINFUL PROCEDURE IN CHILDREN DURING FLEXIBLE FIBEROPTIC BRONCHOSCOPY WITH LOCAL ANESTHESIA. J. Garcia, P. Roure, C. Hayem. Hôpital Lenval - Nice, France.

To evaluate the efficacy of continuous administration of 50% nitrous oxide in oxygen for reducing pain during fiberoptic bronchoscopy, 20 children aged 3-60 months were randomly assigned to an experimental or a control group. Method: Indications for endoscopy included persistent atelectasis (1), persistent wheezing (8), cystic fibrosis (2), persistent pneumonia (8), persistent cough (1). All patients received Midazolam (0,3 mg/kg) atropine (20 mcg/kg) intrarectaly 20 minutes before the procedure. The flexible fiberoptic bronchoscope (Olympus BF3C4) was inserted transnasally through a face mask. Topical anesthesia with 1% lidocaïne hydrochloride (5 mg/kg) was applied to the nose, larynx, trachea and bronchial tree over 15 minutes through the suction channel of the bronchoscope. All patients were monitored with a pulse oximeter and a cardiac monitor. The experimental group (n=12) received 50% nitrous oxide in oxygen prior (3 minutes) and during flexible bronchoscopy. The control group received only oxygen. We measured pain in the children by a behavioral observation scale (Children's Hospital of Eastern Ontario Pain Scale: CHEOPS at each phase of topical anesthesia during bronchoscopy in the two groups. At the end of bronchoscopy, the physician's satisfaction was scored by a visual analogue scale (VAS 0-100) in which 0 corresponded to absence of satisfaction. Results: CHEOPS

	NO_2/O_2	O_2	P
Nose	5.75 ± 1.8	VS 8.1 ± 2.8	p < 0.04
Larynx	7.5 ± 2.5	VS 10.6 ± 0.7	p < 0.007
Trachea	7.35 ± 1.6	VS 10.2 ± 1.1	p < 0.002
Bronchus	6.5 ± 0.6	VS 10.0 ± 1.9	p < 0.01
Exit	5.6 ± 1.4	VS 8.8 ± 2.6	p<0.002
VAS	82.5 ± 16.8	VS 9 ± 18	p < 0.009

Conclusion: Nitrous oxide was associated with lesser pain scores than those with oxygen. Physicians significantly preferred these procedure compared with oxygen. No complication occurred during the procedure. Combined with local anesthesia midazolam and atropine, the administration of 50% nitrous oxide in oxygen seems a better choice for flexible fiberoptic bronchoscopy in children and should be used routinely.

DIAGNOSTIC INDICATIONS FOR ENDOSCOPIC INVESTIGATIONS IN CHILDREN WITH SUSPECTED BRONCHIAL FOREIGN BODY. M. Closset, A. Martinot, C.H. Marquette, A. Deschildre, M. Remy, C. Fourier, V. Hue, P. Ramon, F. Leclerc.
Pediatric intensive care unit, CH&U, Lille, France.

Diagnostic indications for flexible fiberoptic (FFB) in suspected foreign body (FB) aspiration are not well defined. Rationale: we determined the positive predictive value (PPV) of symptoms and signs with the aim to propose the best choice of endoscopic investigations that decreases negative rigid bronchoscopy (RB) rate and misdiagnosis. Methods: we prospectively collected objective data (clinical history, signs and symptoms, radiographic findings) of all children admitted for FB aspiration between February 1993 and September 1995. Asphyxiating FB led to perform immediate RB. Otherwise, low suspicion of FB led to perform FFB and strong suspicion to perform RB. FFB was performed under sedation (midazolam) and topical anesthesia of the airways to exclude the presence of FB. For removal of a FB,

RB under general anesthesia was always performed. Results: of 83 children, 28 had directly RB (5 of them had no FB found) and 55 had FFB (17 had FB which was removed by following RB). Of 43 children who had no FB, 38 (88%) had definite diagnosis without RB. Of 45 children who had RB, 7 (16%) had postoperative complications due to the procedure (1 laryngospasm and 6 laryngeal edema). FFB had 1 (1.8%) postoperative complication (dyspnea due to dislodgment of the FB). Predictive signs of bronchial FB were one-sided decreased breath sounds [PPV=0.84, sensitivity (Se)=0.65], obstructive emphysema (PPV=0.84, Se=0.53) and radiopaque FB (PPV=1.00, Se=0.20). Presence of both signs [decreased breath sounds + obstructive emphysema] increased PPV to 0.94. Other objective data had a low predictive value (PPV< 0.80). Conclusions: we suggest to perform FFB in all children with non asphyxiating suspected FB aspiration in whom radiopaque FB or combination of decreased breath sounds and obstructive emphysema are missing. In other children, RB is performed directly. In the 83 children of the study, this endoscopic management would have decreased negative RB rate from 11% to 2%, without increasing FFB in which bronchial FB was found.

HEMOPTYSIS IN CHILDREN. S. Chafai, A. Abid, A. Zineddine, J. Najib, F. Lasry. Service de Pédiatrie 4, Hôpital d'Enfants Casablanca, Maroc.

In pediatrics, hemoptysis is an uncommon but potentially life-threatening symptom. Almost any disease affecting the respiratory tract may cause hemoptysis. The purpose of this retrospective study is to establish an operative management of hemoptysis adapted to our context. A review of the past five years' experience of our hospital identified 40 patients who have presented hemoptysis. In this series, the most frequent causes of hemoptysis was tuberculosis (32.5%) and bronchiectasis (30%). But, even if the cause of the hemoptysis was often easily established; sometimes problems occurred in the determination of the etiology which may not be discovered. Globally we had two situations: either abnormal chest radiograph findings not explained either by clinical history or by other analyses (biology, bacteriologic exams, bronchoscopy and even histology); or normal radiography and other exams. Therapeutic problems also occurred especially in patients with massive hemorrhaging or recurrent thus potentially life-threatening hemoptysis. Some case histories are presented to illustrate these problems. Based on our findings and the literature, a systemic approach to diagnostic evaluation adapted to our context has been developed.

PEDIATRIC LUNG RESECTION - A 10-YEAR REVIEW. J.P. Duffy, D.C.T. Watson. Birmingham Children's Hospital, Birmingham, UK.

This study examined the indications and outcome of pediatric lung resection in a hospital providing pediatric cardiothoracic surgery to a population of over 5 million. Case notes and radiographs of 51 children undergoing lung resection between January 1984 and September 1994 were reviewed. The indications for surgery, procedures performed, histopathology and outcome were examined. 15 children were less than 1 month old, 12 were 1-6 months old and 24 between 6 months and 13 years at the time of surgery. 6 pneumonectomies, 40 lobectomies, 3 segmental resections and 3 cystectomies were performed on a total of 51 children. Pathological diagnoses were as follows: congenital lobar emphysema 12, bronchogenic cyst 12, cystic adenomatoid malformation 9, bronchiectasis 6, pulmonary sequestration 3, tumors 3 and miscellaneous conditions 6. There were 2 major complications: 1 re-exploration for bleeding and the development of a multiloculated abscess in the remaining lung after lobectomy subsequently requiring pneumonectomy. The only deaths were in 2 of the 6 pneumonectomies. These had complex associated cardiac anomalies and died within 1 week of surgery. In the majority of cases long-term outcome was good. Pediatric lung resection is indicated in a wide range of pathological conditions. It can be accomplished with low morbidity and mortality. Pneumonectomy was associated with a higher mortality than lesser resections and concomitant cardiac abnormalities were a major factor.

CAVITATING PNEUMOCOCCAL PNEUMONIA IN BACTEREMIC CHILDREN. C. Sinaniotis, A. Fretzayas, M. Moustaki, P. Koukoutsakis Ch. Stavrinadis, J. Mathioudakis. 2nd Dep. of Pediatrics, University of Athens, "A. & P. Kyriakou" Children's Hospital, Athens 11527 Greece.

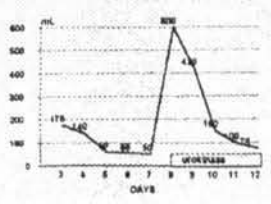
Pneumococcal pneumonias appear at all ages, but peak incidences are seen in young children and the elderly. Streptococcus pneumoniae (Sp) rarely produces necrosis of lung parenchyma especially in children. The emergence of Sp strains resistant to penicillin has become a major concern for the near future. The present study examined the clinical features, laboratory and radiological findings and the outcome of immunocompetent children without predisposing conditions and with community-acquired invasive bacteremic pneumococcal infection who developed lung cavitation during treatment. All patients with lobar pulmonary consolidation on chest X-ray admitted from 01.01.89 to 31.12.94 were eligible. All Sp isolates were screened on 1 μg oxacillin disk and found to be sensitive to penicillin. Serotyping and MIC were not determined. The diagnosis of cavitary lung lesions was confirmed with X-rays, CT and/or US. Of the 920 cases (545 boys and 374 girls, median age 5.1 years), Sp was isolated from blood in 40 patients (4.3%). Eight Sp bacteremic children (1.3% of total patients and 20% of total bacteremic ones, mean age 3.1 years), developed pulmonary abscess. Six of these patients also developed emphysema necessitating drainage and in 4 cases Sp was isolated from the fluid. Cavities with sloughed lung tissue were first detected 5-7 days after admission in spite of prompt IV treatment with penicillin. Toxic appearance and persistence of fever, auscultatory findings and elevated WBS, ESR, CRP for more than 5 days were seen in all patients with lung cavities. Fever lasted for a median period of 23 days. Improvement of auscultatory, radiographic findings and blood indices were evident after 3-4 weeks. Lung cavitary lesions were no longer evident after 10 weeks. Antibiotic treatment was changed to cefotaxime and/or clindamycin (6 patients) or vancomycin (2 patients). In conclusion: a) Sp bacteremic children less than 3 years old are proned to lung abscess formation, b) persistence of fever, blood indices and/or auscultatory findings for >5 days on antibiotic therapy advocates reevaluation of the patient, c) the high morbidity of bacteremic Sp infection justifies further evaluation of Sp serotyping and MIC determination.

LUNG ABSCESS DIAGNOSIS AND TREATMENT IN CHILDREN (About 22 cases). A. Abid, A. Zineddine, J. Najib, S. Chafai, F. Dehbi. Service de Pédiatrie 4, Hôpital d'Enfants, Casablanca, Maroc.

Through a review of 22 cases of lung suppurations diagnosed between January 1980 and April 1992, we analyzed diagnosis and therapeutic problems. The age of the patients ranged from 3 months to 12 years. These lung suppurations included 8 lung abscesses in a pleuropulmonary staphylococcia, 7 pneumonias accompanied by abscesses, 3 pulmonary suppurations on bronchiectasis and 4 abscesses of primitive shape where the etiology was unknown. Chest radiographs showed 25 abscess images: 19 singles and 3 doubles. The latter 3 occurred on pleuro-pulmonary staphylococcia. Echography realized in 16 children was not conclusive in 3 cases. Bacteriologic exams realized in 15 patients by blood culture, pleural or transparietal puncture, showed 7 staphylococcus aureus, 2 Klebsiella pneumoniae, 1 enterobacter, 1 citrobacter and 1 anaerobic streptococcus D. These patients were treated by broad spectrum antibiotherapy, 3 antibiotics in 9 patients and 2 in 12 others. Suppuration evacuation was done by transparietal puncture in 7 cases guided by echography. Evolution of the patient was always good: the mean delay of apyrexia was of 11 days, dyspnea regressed in an average of 3 days and the chest radiograph findings regressed completely in 3 patients and almost completely in 14 cases. However 4 patients kept a cystic image, 2 patients with bronchial rearrangement and 3 patients with bronchiectasis radiographic aspect.

TREATMENT OF LOCULATED PLEURAL EFFUSION WITH INTRAPLEURALLY UROKINASE IN CHILDREN. Yakov Sivan and Alik Kornecki. Pediatric Intensive Care Unit, Dana Children's Hospital, Tel Aviv Medical Center, Tel Aviv University Sackler Faculty of Medicine, Israel.

Loculated pleural effusion may become resistant to simple chest tube drainage. The treatment of such compartmental organization may require surgical intervention such as thoracotomy with septal division or even decortication. Recently, intrapleural fibrinolytic treatment has been suggested in adults. We report two children aged 11 years and 12 years, with massive and multiloculated pleural effusions in whom repeated closed chest drainage (including ultrasound guided) failed - only minimal amounts of fluid drained. In both cases, urokinase (UK) 100,000 U in 100 ml normal saline was instilled into the pleural space via a chest tube, which was then clamped. After 12 hours the tube was reopened and a large amount of fluid drained (600 ml for patient 1 and 280 ml for patient 2). This treatment was repeated daily for 5 days (Figure) with complete resolution of the pleural effusion in both cases. Coagulation studies were unchanged and



Patient No. 1: Daily pleural drainage before and during UK treatment.

no complications were observed. We suggest that intrapleural UK should be used in cases of persistent loculated pleural effusion before surgical intervention is undertaken. This therapy is safe, cost effective and may decrease the need for thoracotomy.

PARAPNEUMONIC PLEURISY. V. Tatochenko. Inst. of Pediatrics, Acad. Med. Sci., Lomonosovsky pr. 2, Moscow 117963, Russia.

The purpose of the study was to characterize methapneumonic pleurisy (MPP) that develops at the end of the 1st week of pneumonia (mostly caused by S. pneumoniae), usually after 1-2 days of effective antibiotics. Pleurisy accompanied 410 of 2399 (17%) pneumonias in hospitalized children, 25% of all effusions were MPP. If effusion (often purulent) accompanied pneumonia from the start, MPP presented as an increase of the exudate's volume with lowered cytosis and predominance of mononuclears. MPP was always sero-fibrinous with <1000 cells in 1mkl, high pH (7,6 - 7,8) and low fibrinolytic activity. MPP was accompanied by a high fever for 6-12 days and elevated BSR. On X-ray a vertical border of sedimented fibrin appeared 2-3 days after the beginning of MPP. MPP often accompanied suppurative pneumonia that may lead to formation of an abscess or pyothorax. High levels of circulating immune complexes (containing S. pneumoniae Ag) and the consumption of complement (both in serum and pleural effusion) as well as nonresponsiveness to antibiotics suggested an immunopathological origin of MPP. While the effect of its early antiinflammatory treatment was uncertain, a few days of steroids were helpful in normalizing irregular fever often seen in the recovery period. Fibrinothorax may persist for 2-3 months.

CONGENITAL DIAPHRAGMATIC HERNIA - OPERATIVE MANAGEMENT AND OUTCOME. J. Schnapka, R. Schmitzberger, Ch. Watfah. I. Univ. Klinik für Chirurgie, Anichstr. 35, A-6020, Innsbruck.

Since 1965 in our hospital, 41 newborns with congenital diaphragmatic hernia have been treated. The aim of our study was to give an overview as to the outcome of these patients. We could show that there was a sharp decrease in mortality rate from 68% to 11% but not by doing the operation immediately on the first day of life but rather waiting until the newborn had stabilized its respiratory parameters. 16 children were followed post-operatively by means of clinical investigation, X-ray study, ultrasound of the diaphragm, lung function tests and ventilation/perfusion scintigraphy. Results of diaphragmatic motility of patients, having had primary closure of the hernia or either dura or Goretex-patch implantation are shown. Data from lung function tests and ventilation-/perfusion-scans are discussed.

BRONCHOPULMONARY INFLAMMATORY PROCESSES IN TRACHEOSTOMIZED CHILDREN. Kundz Khodjaeva. The First Tashkent Medical Institute, Uzbekistan.

The difficulty of decannulation and low effectiveness of surgical intervention in infant tracheocanulars is generally known. In patients of this group, the pathology of larynx and trachea in 100% of cases is combined with bronchial and pulmonary disorders. Pathogenically, there is mutual reinfection of bronchi and tracheostoma. Thus, it is necessary to search for therapeutic measures directed to simultaneous sanation of the lower and upper respiratory tract. A further study of the microbial background of the patient's respiratory tract are thought to be rather prospective. Special examination of 52 children, bearers of tracheal cannulae, was carried out. Thirty-three were treated conservatively for chondro-perichondritis of the larynx and trachea, the rest received medicines to be prepared before restorative operations for scar stenosis of the larynx and anaerobic non-sporogenic microflora of the respiratory tract and tracheostoma. Anaerobic non-clostridial flora was revealed in 27 patients, presented as gram-positive peptococci and fusobacteria. From the gram-negative anaerobes, the clone of bacteroids was selected which was not sensitive or slightly sensitive to such widely used antibiotics as penicillin and its derivatives, as well as to aminoglycosides. Metronidasol, lincomycin and clindamycin exerted marked bacteriostatic influence on the anaerobes. The clinical-bacteriologic correlation was noted: all 27 patients had the persistent course of inflammatory process in the lower respiratory tract in the form of suppurative-hemorrhagic endobronchitis, destructive bronchopneumonia and lung atelectasis. The patients had respiratory insufficiency due to a decrease in lung ventilation and frequent destruction of trachea and bronchi by pathologic exudate. The patients were administrated special etiotropic treatment by anti-anaerobic drugs (metronidazol, lincomycin, clindamycin) introduced intravenously and by inhalation. The course of treatment gave hopeful results. Eleven of 27 patients were decannulated, while in the remainder of the patients, in connection with controlling the inflammatory process of the lungs and bronchi, restorative operations on the larynx and trachea were performed under favorable circumstances. Thus, when planning complex medicines and surgical treatment of infant tracheocanulars, the inauspicious influence of non-sporogenic anaerobes on the course of broncho-pulmonary process should be taken into account.

SURGICAL TREATMENT OF PECTUS EXCAVATUM. J.L. Clément, J. Garcia, C. Haymen, P. Roure, A. Daoud. Hôpital Lenval pour Enfants Malades, 57 Av de la Californie- 06200 NICE.

Deformities of the anterior chest wall sometime bring forth important morphological problems. The psychological repercussions are evident in children and even more so in the adolescent. Moreover the funnel chest, which is a hollow deformation of the anterior wall of the chest, is responsible for major forms of a restrictive respiratory syndrome. The latter promotes the treatment of these deformations and only surgical treatment is capable of correcting the funnel chest. The authors propose frontal chondrotomies associated with sternotomies allowing anterior displacement (Metaizeau technique). This technique permits to obtain a stable spontaneous correction of the deformation without any internal or external contention. The results show good morphological correction and a clear improvement of the restrictive syndrome three months after the operation. The authors insist upon the absence of using osteosynthetic material such as pins, rods or staples which avoid the complications these materials are known to bring about. They recommend this surgical treatment for adolescents who wish to correct this morphological problem and especially because of the existing respiratory repercussions.

MAGNETOSURGICAL CORRECTION OF THE INBORN FUNNEL-SHAPED DEFORMATION OF THORAX AND DIRECTIONS TO ITS USAGE. P. Gvetadze, P. Shotadze, Z. Guruli. Medical Academy of Tbilisi, Republic of Georgia.

We have researched the functional changes of the cardio-respiratory system during the stepped increasing load on 26 patients, divided into 2 groups. The first group consisted of 18 patients with 3rd level deformation (average age 14 years); the second group consisted of 8 patients, operated 5.5 to 10 years earlier, because of deformation at same level (average age at the moment of operation - 7 years). Even at rest, differences were discovered in the researched functional indicators in favor of operated patients: they had lower frequency of heart contractions, more absorption of oxygen per kg body mass, more absorption of oxygen per heart cycle. We performed operative treatment of funnel-shaped deformation of the thorax in children by magnetosurgical correction, which is the subtotal resection of all deformed rib cartilages and transversal wedge-shape sternotomies. The stabilization of rib-sternal complex in the adjusted condition occurs by magnetic stretch. The latter is provided by 2 magnets: an internal magnet, which remains inside the chest, and an external magnet, which is fixed on a special corset. Magnetic stretch lasts 1-1.5 months. The internal magnet is extracted surgically after 5-6 months. Magnetosurgical correction was done on 38 patients aged 5 to 14 years with 3rd (35 patients) and 2nd (3 patients) level funnel-shaped deformation of thorax. The operations were done under endotracheal narcosis in combination with epidural anesthesia. All children had good results with the full correction of deformation and the reverse development of functional infringements of the cardio-respiratory system.

COMPARATIVE ESTIMATES OF RIGID AND FLEXIBLE BRONCHOSCOPY. F.S. Vozzhveva, Ye.V. Klymanskaya, R.R. Andonova, V.H. Sosura. Infant diseases clinic under Moscow Academy named after I.M.Setchenov; B. Pyrogovskaya 19, Moscow, 119435, Russia.

Bronchoscopy has found a wide use in the diagnosis and treatment of chronic suppurative disease of lungs and bronchi in children. The invention of new bronchoscopes for which use in pediatrics is still limited until now, opens new prospects. It is connected with the fact that fibrobronchoscopy puts forward rational anesthesia, adequate pulmonary ventilation and equipment sterilization. The aim of the work was to develop differential indices towards rigid and fibrobronchoscopy in patients with chronic obstructive and suppurative-inflammatory diseases of the lungs and bronchi in children. The authors dispose of the experience of 11,000 rigid and 800 fibrobronchoscopies in children aged between 0 and 14, including newborns, for which 94% of the infants had some indices for endoscopy, due to chronic alien bodies,

tuberculosis, chronic bronchitis, vices of bronchial and tracheal development, neoplasms. A comparative estimate of FBS (fibrobronchoscopy) under local anesthesia yielded a total of 83 cases while RBS (rigid bronchoscopy) yielded 65 cases under anesthesia in patients with chronic suppurative and obstructive bronchitis. Lung ventilation and gas exchange according to Acid-alkaline balance, gas dynamics and pressure in lung artery (according to USI data of heart examination) had given a possibility of finding that FBS passed under the conditions of moderate LUNG hyperventilation and adequate pulmonary ventilation at the expense of natural PO_2 increased against the background of efficient bronchial lavage during the procedure. At the same time, during initial hypoxemia (PO_2 lower than 60 mm of mercury column), the provision of adequate gas-exchange was accompanied with an increase in myocardial hypoxia. High initial indices of pressure in lung artery noticeably decreased following fibrobronchoscopy in 85.9% of children, and in 30 examined patients following bronchoscopy. FBS in case of local anesthesia is an especially efficient and safe method of diagnosis and treatment of suppurative-inflammatory lung and bronchial disease in school-aged children and has led to the regression of endobronchitis in 84.7% of patients. It is also efficient in bronchial lavage and initial low indices of PO_2. Rigid bronchoscopy still remains a method of choice for children of any age in endobronchial and surgery manipulations (extraction of foreign bodies, neoplasms, hemorrhaging, cases of low initial indices of PO_2).

FOREIGN BODY ASPIRATION IN CHILDREN DURING 1980-1995. Mall-Anne Riikjärv, Marja Pärlist, Mare Uritam. Department of Pulmonology, Tallinn Children's Hospital, Nõmme Children's Hospital, Tallinn, Estonia.

Foreign bodies of the respiratory tract are one of the causes of recurrent respiratory diseases in childhood. The aim of this retrospective study was to present the trends of recurrent respiratory diseases due to foreign body aspiration. During a period of 16 years, foreign bodies of the respiratory tract were diagnosed in 66 children (46 boys, 20 girls). The most prevalent age group was 1-3 years (41 children). 1/5 of the children were hospitalized on the first week after aspiration. Hospitalization of other children was due to recurrent pneumonia, obstructive bronchitis or atelectasis, mainly after 1 month of the disease. The data of case history, clinical course and X-ray examination (atelectasis in 16, localized hyperinflation in 26, hypoventilation in 12) raised the indication for bronchoscopy (rigid bronchoscope, general anesthesia). There was slight prevalence of right side aspiration (35/29), and foreign body in trachea in 2 cases. In 52 cases, an organic foreign body was aspirated (nuts, peas and seeds were the most prevalent). There was no significant decrease in the number of foreign body aspiration during the three 5- and 6-year periods, but the prolonged aspiration and respective number of serious bronchial injuries was lower in the last 5 year period (1990-1995). Prevention of foreign body aspiration requires further parental attention to this problem.

RESPIRATORY FUNCTIONAL ASSESSMENT IN CHILDREN WITH CONGENITAL LOBAR EMPHYSEMA WITH OR WITHOUT SURGICAL REPAIR. M.C. La Rocca*, A. Baculard**, E. Osika**, M.H. Muller**, A. Clément**, G. Tournier**. M. Grüner***, M. Boulé*. Depts. of Physiology*, Pediatric Pulmonology** and Surgery***, Hôpital Armand Trousseau, Paris, France.

Congenital lobar emphysema (CLE) is a cause of severe respiratory distress syndrome in infants that may require surgical intervention. After surgery, morbidity rate is low but few data are available as to the evolution of clinical status and pulmonary function. The aim of our study was to report the respiratory functional assessment of 13 children with CLE among whom 11 underwent surgery. Pulmonary function (PF) results were compared to clinical status, chest X-ray and radionucleotide lung scans. A lobectomy (left upper lobe, n=9; median lobe, n=1; right lobe, n=1) was performed at a mean age of 7.8 months (1 to 28 months). PF tests (PFT), including measurement of functional residual capacity (FRC), lung resistance (RI), dynamic impedance (TI) and arteriolized blood gases, were performed at the mean age of 9 months (6 months to 6 years after surgery for operated children). A second PF study was performed in five children at an average of 13 months later (3 to 47 months). *At the first PFT*, in operated children, blood gases were always normal. FRC and RI were also normal, except for one, while Cldyn and TI were always significantly deteriorated.. In the two non-operated children, PFT were normal. Chest X-ray showed a decrease in initial hyperinflation and in compression of the adjacent lung. An important increase in ventilation and a moderate enhancement in perfusion was observed. 3 children developed bronchial disease. *At the second PFT*, an enhancement in Cldyn was observed but persistent abnormalities in TI were always noticed. In conclusion, discrepancies between improvement in X-ray and scan, and remaining PFT alterations, suggest abnormalities in pulmonary growth and involve a longitudinal follow up.

BRONCHOSCOPY IN INFANTS AND CHILDREN. RESULTS FROM 833 CASES AND PERSPECTIVES. A. Zineddine, A. Abid, N. Jilali, A. Sadraoui. Service de Pédiatrie, Hôpital d'Enfants, Casablanca, Maroc.

During the period between June 1990 to November 1995, we have performed 833 bronchoscopies in children. This bronchoscopy was performed in the pediatric unit using a rigid bronchoscope. We opted for rigid material because of the age of the patients, types of diseases observed in our experience, and the cost of fiberoptic bronchoscopy. We preferred local anesthesia (90% of cases) to general anesthesia because it was easier to perform. Among the principal indications, bronchoscopy was performed in 237 cases for the diagnosis and extraction of tracheobronchial foreign bodies. In 137 cases, it was performed to confirm diagnosis and treatment of granuloma of bronchopulmonary tuberculosis. In 133 cases, it helped to clarify the origin of atelectasia and in 133 cases to elucidate diagnostic problems of persistent pneumonia. We believe this technique is very useful in our practice and helps solve many diagnostic problems.

LEFT MAIN BRONCHUS OCCLUSION IN A GIRL WITH RELAPSING POLYCHONDRITIS; A CASE REPORT WITH FOLLOW-UP. O. Sacco, E. Battistini, B. Fregonese, I.L. Macciò, M. Oddone, A. Verna, C. Mereu, G.A. Rossi. G. Gaslini and Scientific Tumor Institutes, Genoa, Italy.

Relapsing polychondritis (RP) is an uncommon inflammatory disease, even more rare in pediatric age, affecting cartilages of the nose, ears, joints, aorta and major airways. An immune reaction against cartilage antigens is the current etiologic hypothesis, resulting in cell damage and consequent cartilage destruction. A 8-year-old caucasian girl was referred to our Department for evaluation of worsening dyspnea. Eighteen 18 months earlier, a diagnosis of RP with involvement of the tracheal cartilages was made elsewhere, and immunosuppressive therapy (prednisone, azathioprine and cyclosporin) was begun. At admission, mild dyspnea was evident with decreased breath sound and rhonchi over the left hemithorax. Pulmonary function tests showed decreased lung volumes (V) and flows (F), and the shape of the forced expiratory and inspiratory F-V loop was characteristic of a fixed obstruction of the central airways. Thorax CT scan and NMR demonstrated narrowing of the main left bronchus, leading to air trapping in the left lung. Fiberoptic bronchoscopy demonstrated deep mucosal erosion of the carina between the upper right bronchus and the "truncus intermedius", and severe concentric fibrotic stenosis of the main left bronchus. Complete recanalization of the fibrotic stenosis was obtained with Nd YAG laser therapy, performed through a rigid bronchoscope. In the 10 days following the procedure, four more Fbs were performed to remove fibrinoid material occluding the treated bronchial segment. One month later, the F-V loop was normal and the endoscopic view of the left bronchus showed a good patency. Relapse of the main left bronchus was documented by a pulmonary function test seven months later, despite the ongoing immuno-suppressive therapy. A second rigid bronchoscopy was then performed, and an endobronchial stent was positioned with good bronchial patency. A six-month follow-up so far reveals the success of this treatment, with the patient free of any respiratory symptoms.

ENDOSCOPIC BALLOON DILATATION OF ACQUIRED AIRWAY STENOSIS IN INFANTS. D. Rocca, I. Pin, F. Blanc-Jouvan, G. Ferreti, C. Durand, E. Ghosn, P. Baudain, M. Bost. Département de Pédiatrie et Service de Radiologie Pédiatrique, CHU de Grenoble, France.

Stenosis of the trachea bronchi in the first months of life may be acquired as complications of respiratory neonatal intensive care. Their treatment is still difficult. Endoscopic balloon dilatations can be an effective, repeatable and easy method of treatment. We report the case of an infant born at 31 weeks of gestation, who required intubation and assisted ventilation 45 days for a stage 3 hyaline membrane disease complicated by bronchopulmonary dysplasia. A rigid bronchoscopy was performed at day 43 because of a persistent right lower lobe atelectasia. It showed an obstructive granuloma with complete obstruction of the lower extremity of the right main bronchus, probably due to repetitive traumatisms of sucking catheters. Systemic corticosteroids were

prescribed. Respiratory improvement allowed weaning of continuous nasal oxygen at 8 months of age. Nevertheless chest X ray showed recurrent right lower and middle lobe atelectasia. Fiberoptic bronchoscopy performed at 8 months of age showed a tight circumferential and non inflammatory stenosis reducing by 90% the diameter of the middle bronchus, just below the origin of the upper lobe bronchus. Bronchography confirmed that the stenosis was limited in length (3 mm) with normal underlying bronchi. At 16 months of age, endoscopic balloon dilatation was performed under general anesthesia, using a Fogarty catheter (Schneider, diameter 5 mm, length 2 cm). The stenosis was catheterized under fibroscopic control and the balloon positioned under fluoroscopic control.. Three consecutive dilatations were performed for 1 minute, applying an increasing pressure of 3, 5 and 7 atmospheres. The procedure was well tolerated and the immediate result was satisfactory, despite a minor inflammatory reaction. The chest X ray showed a better expansion of the 2 right lobes. A new fiberoptic control was performed at 19 months of age and showed a partial restenosis (40%) of the bronchus, treated at the same time by a new dilatation, with complete immediate success. The chest X ray showed a minimal decrease of the middle and lower right lobes. One year after the dilatation, the infant is doing well, without respiratory symptoms. In conclusion, endoscopic balloon dilatation is the treatment of choice for acquired fibrotic stenosis of the main bronchi in infants. It can be repeated in case of recurrence of the stenosis. However the long term prognosis of these stenosis is still under question. Prevention in neonatal care is based on avoiding sucking catheters passing beyond the low extremity of the endotracheal tube.

PERSISTENT RIGHT LOWER LOBE ATELECTASIS FOLLOWING PROLONGED INTUBATION. Masataka Higuchi[1], Chuichi Kijimoto[2], Yasuko Tsuchiya[2], Shin-ya Kondoh[3], Morihiro Saeki[4], Hiroshi Kurokawa[1], Kazuteru Kawasaki[1], Masaki Itoh[3], Tomoo Miyakawa[2], Mitsuko Sugimori[1], Yoshiki Yokoyama[2], Chikako Nakajima[2] and Michiyo Okada[1]. [1]Department of Pediatrics, School of Medicine, Keio University, Tokyo. [2]Division of respiratory diseases, National Children's Hospital, Tokyo. [3]Division of respiratory diseases, Tokyo Metropolitan Kiyose Children's Hospital, Tokyo. [4]Department of Surgery, National Children's Hospital, Tokyo, Japan.

Acquired bronchial stenosis in infants following prolonged endotracheal intubation is a difficult problem with significant morbidity. We experienced 4 cases with persistent right lower lobe atelectasis following prolonged intubation. Three of them were low birth weight (< 1500 g) infants and endotracheally intubated at birth due to respiratory distress syndrome. The other case was a full-term infant with congenital heart disease and intubated at 3 days after birth due to heart failure. Duration of intubation for all patients was beyond 2 months. After extubation, all 4 patients suffered from recurrent pneumonia and bronchitis. Repeated chest X-ray demonstrated persistent right lower lobe atelectasis. Bronchography and bronchoscopy revealed the same consequences of very severe stenosis of the right lower lobe bronchus. After these examinations, 2 of the infants received prophylactic antibiotics therapy and were significantly improved. The others underwent resection of the right lower lobe. These pathological findings revealed dense fibrosis in the entrance of the right lower lobe bronchus. It was necessary to perform prolonged intubation for all 4 patients. Therefore, continuous trauma by suctioning procedure and endotracheal tube motion, as well as respiratory tract infection, general status, and prematurity may enhance the formation of dense fibrosis in the bronchial tissue. In these cases, bronchoscopy can be useful for establishing early diagnosis and provide the correct management, such as suctioning procedure, and prevent further injury of the bronchus during mechanical ventilation, and hence achieving prompt extubation.

DEVELOPMENTAL CHANGES IN PULMONARY AND SYSTEMIC VASCULAR SMOOTH MUSCLE MYOSIN LIGHT CHAIN PHOSPHATASE AND KINASE IN SHEEP. Jacques Belik, Ewa Kerc, Viciany Fabris, Mary Pato. Dept. of Pediatrics, University of Calgary and Department of Biochemistry, University of Saskatchewan, Canada.

We have previously reported significant age related changes in vascular smooth muscle mechanical properties in sheep. Early in life the pulmonary and systemic vascular muscles show a lower stress compared to the adult. Since muscle contractility is dependent on the activity of its regulatory proteins, we evaluated sheep fetal pulmonary arterial, aorta and vena cava myosin light chain kinase (MLCK) and phosphatase (MLCP) activity (nmol/min/mg) and compared it to the respective adult tissue. The MLCK activity was determined by the incorporation of $[^{32}P]0_4$ to the 20 kDa smooth muscle myosin light chains and the MLCP by assaying for the dephosphorylation of the substrates, 20 kDa myosin light chain (PLC) and heavy meromyosin (PHMM). Results: Significant age changes in MLCK but not MLCP activity were observed for the pulmonary artery and aorta. In addition, the aorta had the highest and the vena cava the lowest MLCK activity in the fetus and adult ($P < .01$). In conclusion, muscle MLCK activity is proportional to vascular resistance and may be an important determinant of age and circulation specific differences in vascular smooth muscle mechanical properties (Supported by grants from the Medical Research Council of Canada).

PECULIARITIES OF ANTENATAL DEVELOPMENT OF THE RESPIRATORY SYSTEM. Ramaz Khetsuriani, Department of Anatomy, Tbilisi State Medical University, Vazha-Pshavela Av. 33, 380077 Tbilisi, Republic of Georgia.

It is known that there is an observed developmental anachronism in ante- and postnatal autogenesis of developmental dynamics of particular organs and systems in humans, which is expressed by priority development of some systems at particular levels of life in comparison to other systems. Of particular interest is the issue of peculiarities in development of respiratory organs. As it is well known, such organs are vital and their functional status is very important for metabolism in neonates. We have studied the changes of thoracic shapes and sizes of neonates from 1938 to 1990, as well as the degree of pulmonary tissue development. It has been determined that thoracic perimeter and volume change their magnitude in correlation with other anthropologic parameters. Almost all anthropological parameters have been increased with acceleration. For 1990, the thoracic perimeter of Georgian neonates assumed 36.09 + 0.17. It exceeded the similar parameters for 1938 by 2.96 cm, but the correlation between the level of lung and anthropologic data has not always been observed. The thoracic shape is extremely important for the development of the respiratory system. The materials including recommendations for age of children from 0 to 1 year, will be presented at congress. These recommendations should assist in controlling the normal development of the respiratory system. All recommendations and conclusions of this work are destined to pediatricians of different profiles.

IMMUNOCYTOCHEMISTRY LOCALIZATION OF IGF-I RECEPTORS (IGF-IR) IN CHILD LUNG. A. Labbé*, G. Grizard**, Y. Loriette Y, T.H. Orliaguet,***, P. Dechelotte***. *Unité de Réanimation et des Maladies Respiratoires de l'Enfant, **Laboratoire de Biologie du Développement, ***Laboratoire d'Anatomie Pathologique, Hôtel-Dieu, Clermont Ferrand, France.

We recently observed specific binding of $[^{125}I]$-IGF-I in solubilized membranes from human lung. Immunocytochemistry localization of IGF-I R was done to confirm its presence in fetal and postnatal lung. Lung tissues were obtained from 12 fetuses of 17 to 34 weeks after therapeutic or spontaneous abortion, from 4 infants (autopsy) and a child (7 years) after lobar resection. All samples were taken from the right lower lobe. They were frozen in liquid nitrogen and stored at -80 C. Immunohistochemical study was performed on frozen sections. The first antibody consisted of a mouse monoclonal directed against IGF-I receptors (alpha sub-unit) (Santa Cruz Biotechnology). Amplification of the reaction was done using streptavidin-biotin-peroxydase complex. The chromogen was AEC. Labeling did not change with gestational age. No distal (alveolar) cells were labeled in the epithelium, only those of the bronchus and bronchiolus. Mesenchymal cells and those situated beneath and close to the epithelium were also labeled. Capillaries of the mesenchyme were labeled, including those that bulged in the alveolar lumen through the epithelium. When macrophages were present in the lumen they were also labeled and generally strongly. Immunocytochemical localization of IGF-I R confirmed its presence in the epithelial and mesenchymal cells in both the fetal and postnatal period. These findings indicate a specific role of this growth factor in human lung differentiation.

LARYNGO-TRACHEAL OBSTRUCTION SEQUENCE ILLUSTRATED BY THREE OBSERVATIONS OF ANTENATAL SCREENING. A. Clemenson*, J.P. Buono*, O. Levrel*, P.H. Vanlie-Feringhen**, P. Dechelotte*, A. Labbé**. *Laboratoire d'Anatomie Pathologique, **Unité de Réanimation et des Maladies Respiratoires de l'Enfant, Hôtel-Dieu, Clermont-Ferrand, 63003, France.

The only currently recognized cause of pulmonary hyperplasia is the presence of fetal pulmonary fluid retention. This may be of mechanical or functional origin. According to the seat of the obstacle, the hyperplasia may be

bilateral (laryngeal or tracheal affection) or unilateral to one lobe (affection of the lobe bronchus). We present three observations of pulmonary hyperplasia. In all three cases antenatal screening was done by systemic obstetric ultrasonography. The first observation consisted of a unilateral hyperplasia localized to a lobe of the left lung, due to stenosis of the culminal bronchus. In the second observation, bilateral pulmonary hyperplasia was consecutive to laryngeal atresia; this was associated with other malformations integrating a Fraser syndrome. The retention of pulmonary fluid prevented the occurrence of pulmonary hypoplasia habitual in oligohydramnios; it even exceeded the preventive effect and provoked a pulmonary hyperplasia. In the third observation, laryngeal atresia and the resulting hyperplasia did not occur within a polymalformative context. The pulmonary hyperplasia was accompanied by severe anasarca including edema and ascites, but no pleural effusion. The screening for signs that favor laryngeal or tracheal affection should be included in the test for fetoplacentary anasarca.

CLINICAL FEATURES OF PROLONGED PRODUCTIVE COUGH IN CHILDREN. C. Nakajima, Y. Yokoyama, T. Miyakawa, Y. Tsuchiya, C. Kijimoto. National Children's Hospital, Tokyo, Japan.

Some of the children with chronic cough may develop chronic bronchitis or bronchiectasis in the future. We studied the clinical features and the efficacy of treatment of children with prolonged productive cough in order to prevent the development of chronic lung disease. Methods: We studied the characteristics and the duration of cough, past history, physical findings and chest roentgenographs of 51 patients with cough lasting more than 3 weeks in our hospital, then compared the clinical features with patients with and without positive findings in physical examination or chest roentgenographs, and the efficacy of treatment of the patients with productive cough treated with and without physiotherapy. Results: There were 34 (67%) children with productive cough having physical or roentgenological positive findings, consisting of 18 boys and 16 girls whose ages ranged from 11 months to 7 years 3 months (median: 3 years 1 month). The duration of cough was from 3 weeks to 2 years (median: 10 weeks). The cough was prominent during the nights and early morning. Forty-seven percent had wheezing besides the cough, and by auscultation had wheezes or coarse crackles. Eighty-eight percent had peribronchial shadows (PBS) or atelectasis on chest roentgenographs. Patients treated with physiotherapy had improved cough, physical and roentgenological findings significantly better than those without, but there was no remarkable difference seen between the patients treated with and without antibiotics. Conclusion: Most of the prolonged coughs in childhood are productive and with concomitant physical or roentgenological findings. Physiotherapy was most effective for these patients suggesting that the first choice of therapy for prolonged productive cough is to eliminate standing sputum from the bronchi in childhood.

THE HERING-BREUER DEFLATION REFLEX; A ROLE IN APNEA OF PREMATURITY? S. Hannam, D.M. Ingram and A.D. Milner. Dept. of Pediatrics, UMDS, St. Thomas' Hospital, London, SE1 7EH, UK.

The Hering-Breuer deflation reflex, whereby deflating the lung increases the force and rate of inspiratory effort, has been described in many species. The role of the reflex in the human is controversial. Term infants respond to chest compression with a rapid augmented inspiratory effort, a shortening of expiration and prolongation of inspiration. It is likely that these are the manifestation of the Hering-Breuer deflation reflex in the human neonate. Our aim was to investigate the response of well preterm infants to a rapid reduction in lung volume. Twenty preterm and ten term infants were studied. Tidal volume and airflow at the mouth were measured using a reverse plethysmograph-pneumotachograph system. The infants were placed in an inflatable jacket with a rigid outer wall enabling the force of the squeeze to be directed inwards. Twelve of the preterm infants had chest wall movement measured using inductance plethysmography. Apneic pauses (2-7 seconds) were seen in 15/20 preterm infants on squeezing. The number of apneas occurring on squeezing were significantly greater than those happening spontaneously ($p<0.05$). The apneas were central in origin in 57% of the cases. The mean percent shortening of expiration on squeezing was significantly less in the preterm infants compared to the term infants (-18% vs -35%, $p<0.01$). Inspiration following a squeeze was prolonged in term infants compared to a shortening in the preterm infants ($p<0.01$). In the preterm infants, inspiration was shortened more in the group having apneas when compared to the group not having apneas (-31% vs -15%, $p<0.01$). The observation that rapidly reducing the volume of the lung can cause apneas has not been previously reported. Our findings may be explained by a functional immaturity of the Hering-Breuer deflation reflex in the preterm infant. As the shortening of inspiration was greatest in the preterm infants having apneas, it may be the case that a deficient Hering-Breuer deflation reflex has a role in apnea of prematurity.

DETERMINANTS OF LARYNGEAL CLOSURE DURING PROVOKED CENTRAL APNEAS IN LAMBS. I. Kianicka, V. Diaz, D. Dorion, R. Drolet, P. Létourneau, E. Canet, J.F. Leroux, J.P. Praud. Dept. Pediatrics and Pulmonary Research Unit, Sherbrooke J1H 5N4 Quebec, Canada.

Previous clinical observations have suggested that active laryngeal closure could be present during central apnea, either at birth in asphyxiated newborns or in premature infants with severe repetitive apneas. We have shown in a series of experiments in lambs that continuous TA EMG (thyroarytenoid muscle, a glottic adductor muscle) was indeed present throughout apnea induced by various means. However, the mechanisms causing active glottic closure remain highly debated. The aim of the present study was to examine whether the decrease in end expiratory volume at apnea onset (acting through pulmonary slow adapting receptors) or low PaO_2 (acting through peripheral chemoreceptor or cerebral tissue hypoxia) are crucial in determining onset and maintenance of TA EMG. Methods: Respiratory arrest was induced in 27 lambs aged from 2 to 30 days by injecting pentobarbital intravenously (5 doses of 65 mg at 1 min interval), or by giving 3-4% halothane in air in 5 lambs. We continuously recorded airflow (facemask or endotracheal tube + pneumotachograph) and TA EMG in all lambs, and measured arterial blood gases (brachial artery catheter). Lateral cricoarytenoid muscle (LCA, another glottic adductor) EMG was also recorded in 6 lambs. End expiratory lung volume was prevented from decreasing at apnea onset in 3 lambs by applying a 5 cm H_2O positive and expiratory pressure on the expiratory limb of a non rebreathing, 2 way valve before injecting pentobarbital. Finally, hyperoxia was induced in 4 other lambs by pure O_2 breathing for the 10 min preceding respiratory arrest. Results: In all lambs, continuous TA EMG abruptly appeared within 3 sec of airflow cessation, increasing thereafter to a plateau before progressively decreasing and ultimately fading out a few sec before disappearance of ECG. The entire duration of continuous TA EMG was 115 to 230 sec. Continuous LCA EMG paralleled TA EMG. Furthermore, the time course of both TA and LCA EMG was similar in the 3 lambs with elevated end expiratory volume and in 3 of the 4 hyperoxic lambs. Conclusion: Neither a decrease in end expiratory volume nor hypoxia appear to be crucial for the tonic, active glottic closure observed with respiratory arrest induced by a respiratory depressant in lambs. These and other personal results in hyperoxic or vagotomized apneic lambs lead us to hypothesize that active glottic closure in central apnea is rather due to complex interactions between brainstem centers controlling thoracic inspiratory muscles and laryngeal muscles. This is reminiscent of the respiratory pattern observed in fetal life, with periods of respiratory movements alternating with apnea and active glottic closure. Supported by MRC Canada, grant # 7137.

EFFECT OF EXOGENOUS DOPAMINE ON RESPIRATION IN NON-SEDATED FETAL AND NEWBORN LAMBS. I. Kianicka, V. Diaz, H. Gagnon, B. Gagné, J.P. Praud. Pulmonary Research Unit, Univ. Sherbrooke J1H 5N4 Quebec, Canada.

Dopamine (DA) is considered to be the main neurotransmitter involved in chemotransduction in mammalian carotid body, acting principally through DA_2 receptors. However, the effect of exogenous DA on carotid body activity is still debated, since in adult mammals DA induces inhibitory effect in vivo but excitatory effect in vitro. And the situation appears even more complex in the perinatal period, with the observation of both inhibitory and excitatory effects in the anesthetized newborn kitten (Respir Physiol 90;173, 1992). The aim of the present study was to test the effect of DA on respiration in non sedated lambs pre- and postnatally. We recorded diaphragm EMG (chronic wire electrodes) in 9 fetuses, gestational age 117-137 days, or ventilation (pneumotachograph) in 4 newborn lambs studied twice at <3 and >14 days of life. A bolus of DA (10 μg/kg) and saline (control) was injected intravenously in all animals. In 4 fetuses and 2 lambs, DA injection was repeated 5 min after IV injection of haloperidol (1mg/kg), a DA receptor antagonist. Results: DA injection elicited within 15 sec 1) a transient diminution of fetal breathing movements in all fetuses, with a short apnea in 7 and 2) a decrease in ventilation in newborn lambs, less marked before 3 days. Haloperidol injection increased baseline respiration in 2/4 fetuses and 2/2 lambs. In haloperidol pretreated animals, DA inhibitory effect was largely decreased or

abolished. No changes in respiration were observed after saline injection. Conclusions: Exogenous DA inhibits respiration in non-sedated fetal and newborn lambs. This inhibitory effect is blunted in the first 3 days of life. Haloperidol markedly reduces or abolishes DA effect. Our results suggest that carotid body-DA_2 receptors are already present and functional late in gestation. Additionally, increased inhibitory effect of DA in older lambs could be related to postnatal resetting of carotid body sensitivity. Funded by MRC, grant # 7137.

UPPER AIRWAY DYNAMICS FOLLOWING PULMONARY C FIBER STIMULATION IN AWAKE LAMBS. V. Diaz, I. Kianicka, J.P. Praud. Dept. Pediatrics and Pulmonary Research Unit, Sherbrooke, J1H 5N4, Quebec, Canada.

We have recently shown that pulmonary edema in awake lambs consistently enhanced the expiratory phasic EMG activity of both a laryngeal constrictor (the thyroarytenoid muscle, TA), and the inferior pharyngeal constrictor muscle (IPC) with expiratory upper airway closure. Consequently, we hypothesized that pulmonary C fiber, known for being activated during pulmonary edema, could play a role in upper airway muscle activation during pulmonary edema. However, we were unable to find any previous data pertaining to the response to C fiber stimulation in non-sedated newborn mammals. The aim of the present experiment conducted in 5 non-sedated lambs aged 10 to 19 days was to study upper airway dynamics during stimulation of pulmonary C fibers by IV injection of capsaicin. Methods: We recorded airflow (facial mask + pneumotachograph), and TA and IPC EMG (intramuscular electrodes) during baseline room air breath and after injecting a bolus of 5 to 10 μg/kg capsaicin into the superior vena cava. Results: During baseline recording, phasic expiratory EMG was observed in 4/5 lambs for the IPC but in only one lamb for the TA. Capsaicin injection was responsible for a central apnea lasting 5 to 10 seconds followed by rapid shallow breathing for 2 to 4 min without expiratory airflow braking. Continuous TA EMG abruptly appeared in all lambs with apnea onset and was observed from 3 sec (3 lambs) to the whole apnea period in 2 lambs. Simultaneously, continuous IPC EMG was present throughout apnea (4 lambs) or beginning when TA decreased, i.e. 3 sec after apnea onset, in the remaining lamb. Finally, the following period with rapid shallow breathing was marked by increase in both inspiratory and expiratory phasic IPC EMG, while TA EMG was absent in all lambs. Conclusion: 1) Stimulation of pulmonary C fibers in awake lambs leads to the classical response consisting of an initial apnea followed by rapid shallow breathing; 2) continuous laryngeal and pharyngeal constrictor muscle EMG is present during apnea; 3) rapid shallow breathing is accompanied by increased IPC EMG without TA EMG or expiratory airflow braking. We hypothesize that 1) IPC EMG during rapid shallow breathing could serve to stiffen the pharynx, allowing for increased airflow during augmented breathing efforts; 2) the active expiratory upper airway closure observed during pulmonary edema in awake lambs is not due to pulmonary C fiber activation. Supported by CRM MT 7137.

CONGENITAL CENTRAL HYPOVENTILATION SYNDROME IN AN INFANT TREATED BY NASAL VENTILATION. M.H. Estevao, M.J. Brito, A. Mirante, J. Moita, J. Oliveira. Hospital Pediatrico de Coimbra, Laboratorio de Estudos de Patalogia do Sono, Centro Hospitalar de Coimbra-Portugal.

Congenital Central Hypoventilation Syndrome (CCHS), a disorder of ventilatory control, requires respiratory support by mechanical ventilation which is sometimes associated later with diaphragmatic pacing, depending on the severity of the disease. Most children, at least at the first months of life, need a tracheotomy, which means a huge burden for the family. We report a case of a two-year girl that has been on Intermittent Positive Pressure Ventilation by nasal mask during sleep since her sixth month of age. She was on nasotracheal intubation until then because a small mask was not available. Adaptation was optimal and she was discharged when she was ten months old. Since then, she has been doing well, and had only two short hospitalizations for banal upper respiratory tract infections. Physical and intellectual development are adequate. It is possible to begin and maintain a small infant with CCHS on **nasal ventilation** during sleep without complications and with a much better quality of life for the child and her family.

SYSTEMIC CORTICOSTEROIDS DO NOT EFFECTIVELY TREAT OBSTRUCTIVE SLEEP APNEA (OSA) DUE TO ADENO-TONSILLAR HYPERTROPHY (ATH). Robert T. Brouillette, Saleh A. Al-Ghamdi, John J. Manoukian, Angela Morielli, Kamaldine Oudjhane, and Francine M. Ducharme. Depts of Pediatrics, Otolaryngology and Radiology, McGill Univ., Montreal Children's Hospital, Montréal, Québec, Canada.

There is reason to suspect that pediatric OSA due to ATH could be treated by a short course of systemic steroids. For instance, steroids can reduce tonsillar size in infectious mononucleosis. We therefore performed assessments of symptomatology, ATH, and OSA severity before and after a 5 day course of 1 mg/kg/day of oral prednisone in 9 children (6 girls). Selection criteria included age 1-11 years, a mixed/obstructive apnea/hypopnea index (MOAHI) of ≥ 3/hr, ATH, symptoms suggesting OSA, and intent to perform adenotonsillectomy. Before and after steroid treatment, physical and radiographic exams documented ATH, and home polysomnography (Pediatr Pulmonol. 20;241-52, 1995) and a questionnaire-based OSA score (J. Pediatr. 105:10-14, 1984) documented severity of OSA. Results: Only one child showed enough improvement to avoid operation. Clinical symptomatology did not improve after steroid treatment but did after removal of tonsils and/or adenoids: OSA score ($x \pm SD$), 1.8 ± 2.2 vs 1.5 ± 2.2 vs 2.7 ± 1.6, $p < .01$. Polysomnographic indices of OSA severity did not improve after steroid treatment: MOAHI, 13.9 ± 15.2 vs 9.9 ± 7.1, $p = 0.29$. Tonsillar size decreased in only two patients; adenoid size was marginally reduced after steroids: adenoid/nasopharyngeal ratio, 0.69 ± 0.10 vs 0.63 ± 0.09, $p = .05$. Conclusions. These results suggest that a larger, double-blind placebo controlled trial of systemic corticosteroids is not warranted. However, recent data (Pediatrics 95:355-64, 1995) suggest that a longer course of nasal steroids might reduce adenoidal size, improve symptomatology, and decrease OSA severity. Support: The Hospital for Sick Children Foundation.

GASTROESOPHAGEAL REFLUX IN GENESIS OF SUDDEN INFANT DEATH SYNDROME. B.T. Kholmatova, M.S. Abdullabodjaev, T.A. Kuznetsava. Tashkent Medical Pediatric Institute, Republic of Usbekistan.

Mechanical food obstruction of the respiratory tract because of stomach reflux may cause prolonged apnea. We analyzed 52 cases of infant (up to one year old) deaths at home. Among them: boys-74%, girls-26%. In 13 cases during autopsy, mechanical asphyxia was diagnosed as a result of closing of the respiratory tract because of food. Among them: 1 boy and 2 girls not more than 6 months old. Most of the infants died during sleep, some time later after feeding. They were swaddled tightly and put into narrow national wooden cribs. The day before, all the infants were fine. As the mothers held them, some of them belched once after feeding, but without any treatment. The infants were suckled in the wooden crib after which suckling infants remained lying in horizontal position tightly swaddled. In 10 cases during autopsy, SIDS was diagnosed. Among them: boys-60%, girls-40%. In 6 cases, the infants were found dead in their wooden crib early in the morning one or one and a half hours after being fed. During dissection, food was found in the respiratory tract. But under microscope investigation in segmented bronchi, bronchioles, respiratory tract and lung alveolars, aspiration masses had not occurred. In conclusion: microscope findings during autopsy show that suspicious stomach masses in the field of the upper part of the respiratory tract must not be the cause of death because of food aspiration. Sleeping tightly swaddled in a narrow wooden crib makes the process of gastroesophageal reflux worse.

SUDDEN INFANT DEATH SYNDROME (SIDS) IN THE CONTEXT OF INFANT MORTALITY. T.A. Kuznetsova, Z.A. Giyasov, B.T. Kholmatova. Tashkent Medical Pediatric Institute, Republic of Uzbekistan.

According to official statistical data, infant mortality in Uzbekistan is determined in the first line by perinatal pathology and by acute respiratory diseases. At that, one third of all fatal cases are made up of mortality at home. Expert analysis of cases of infant death studied by autopsy was conducted during 6 years. The analysis has demonstrated divergence between official and verified data. This lack of correspondence is connected in the first line with hyperdiagnosis of pneumonia at autopsy, and also with erroneous inclusion of SIDS victims in the group of infants deceased from pneumonia. Expert data has shown that SIDS is the cause of half of the lethal cases at home. SIDS frequency in Tashkent for different years was between 0.9 and 2.1 per 1000. Clinical and sociological analysis of SIDS cases has shown that mainly infants in the first six months of life die of SIDS with maximum frequency at 3-4 months in families with unsatisfactory and unstable conditions when attention to the child is insufficient (78% of cases). 97% of women who lost their children by SIDS had a low educational level, they were housewives or were employed in physical labor. Only 18% of infants were

found dead in their own bed, 22% in bed with their parents. The rest of them died in tightly swaddled position in traditional wooden cradles. Proportion of boys and girls dead from SIDS was found to be similar. 65% of cases occurred in autumn and winter seasons. 20% had common symptoms of an acute respiratory viral infection. Thus, it is necessary to take into account the importance of SIDS and its social and biological risk factors when planning measures aimed at reducing infant mortality.

RECURRENT MUCO-EPIDERMOID BRONCHIAL CARCINOMA IN A 4 YEAR OLD CHILD. F.P. Counil, H. Allal, S. Guillaumont, R.B. Galifer, M. Voisin, P. Baldet, I. Serre, D. Lesbros, R. Dumas. Service de Pédiatrie I, Service de Chirurgie Infantile, Laboratoire d'Anatomopathologie, CHU de Montpellier-Nîmes, France.

A 4 year old boy was hospitalized in our pediatric department in March 1994 with a severe hemoptysis. 15 days before his admission an episode of acute thoracic pain with fever resolved spontaneously at home. The pulmonary x-ray showed a left lower lobe atelectasis. On computed tomography scan, the left lower lobe bronchus lumen was obstructed by a tissue mass. No extension towards the mediastinum was seen. Vascular abnormalities were excluded by arteriography. Bronchoscopy confirmed the endobronchial development of a mass lesion with a left main bronchus obstruction of 50%; the biopsy was not performed because of bleeding. Investigations for metastasis and tumoral factors were negative. A lobectomy of the left lower lobe was performed. A polypoidal tumor originated from the lower lobe bronchus. Optic microscopy revealed a pure glandular tumor without metaplastic squamous epithelium. Bronchial section and lymph node biopsies were normal. The left lower lobe was involuted with suppurated bronchiectasis. Immediate post-operative evolution was uneventful. 4 months later, the child was admitted again with a severe hemoptysis. The bronchoscopy revealed a mass lesion in the left main bronchus. The biopsy confirmed an identical tumor structure to the previous one. A tumoral resection of the left main bronchus and the remaining left lower lobe bronchus was performed. The histopathological analysis concluded to a muco-epidermoid carcinoma. The biopsies for local or lymph nodes extension were negative. The follow-up is satisfactory 1 year post-operative, with negative biopsies and minimal pulmonary function abnormalities. Although muco-epidermoid carcinoma are not considered as malignant tumors, this case illustrates the potentially aggressive evolution of such tumors. Since the simple tumoral resection is now performed by most of pediatric surgical teams, a close follow-up with bronchoscopy and repeated biopsies is mandatory.

BRONCHIAL MUCO-EPIDERMOID CARCINOMA MIMICKING ASTHMA SYMPTOMS IN A BOY. E. Battistini, B. Fregonese, V. Jasonni, A. Granata, P. Gianiorio, C. Gambini, G.A. Rossi. G Gaslini Institute, Genoa, Italy.

A 8 year old child with a previous history of mild asthma was referred to us for the occurrence in the last months of cough and wheezing not responsive to beta-2 agonists and corticosteroids. A chest x-ray showed a zone of increased density in the left hemithorax along the spine, that the thorax CT-scan demonstrated to correspond to the area occupied by the apical segment of the left lower lobe. Fiberoptic bronchoscopy revealed an endobronchial mass with a soft, jelly-like appearance, partially stenosing the origin of the left lower bronchus. While bronchoalveolar lavage and bronchial brushing were negative for cytological features of pulmonary malignancy, biopsy of the lesion was diagnostic for a low-grade muco-epidermoid carcinoma. This is a rare tumor in childhood, only 43 case reports being described in literature. The treatment is surgical and an early diagnosis can increase the chance of a selective procedure. The patient underwent a sleeve lobectomy and his pulmonary function tests three months after surgery demonstrated a well preserved forced vital capacity. The follow-up of the patient 8 months after the lobectomy shows no local recurrence of the tumor. We conclude that, although primary tumors of the lung are uncommon in pediatric age, they must be considered in the differential diagnosis of respiratory symptoms not responsive to usual medical therapy.

TUBERCULOSIS INFECTION IN CHILDREN WITH OSTEOSARCOMA. M. Jiménez, P. Leon, M. Riol, L. Sierrasesumaga, Department of Pediatric Oncology, University Hospital, University of Navarra, Pamplona, Spain.

Cancer patients undergoing chemotherapy are a high-risk group for developing tuberculosis. The relative risk for tuberculosis infection in pediatric patients with solid malignant tumors range from 1 to 36% (Rieder et al., Epidemiol Rev, 1989). Sixty pediatric patients were treated for osteosarcoma in our Pediatric Oncology Department from 1990 to 1995. Three of them (5%) developed tuberculosis during chemotherapy; two with clinical symptoms, such as fever, cough and asthenia and a third featured in chest radiograph. A positive tuberculin skin test was detected only in one of the patients and chest radiograph showed several lung nodes, especially in lower lobes, without adenopathies. Tuberculosis infection was confirmed by positive sputum culture to tuberculosis in two patients requiring biopsy in the third one because of differential diagnosis with osteosarcoma metastases. The guidelines for treatment consist of isoniazid and rifampin for 6 months and pyrazinamide for 2 months. One patient died during tuberculosis treatment because of tumor progression and the others are free of tuberculosis infection. Differential diagnosis with tuberculosis should be done in pediatric patients with osteosarcoma and lung metastases and current guidelines for tuberculosis treatment are effective in these patients.

PULMONARY FUNCTION OF CHILDREN SURVIVING ACUTE LYMPHOBLASTIC LEUKEMIA - A LONG TERM FOLLOW-UP. E. Horak, R. Schmitzberger, F.M. Fink. University Hospital for Children, A-6020 Innsbruck, Austria.

Very little is known about the effects of chemotherapy on pulmonary function in long term survivors of acute lymphoblastic leukemia (ALL). Some drugs have well known pulmonary toxicity and, during therapy, children with leukemia are more liable to develop lower respiratory tract infection. Both have the potential to damage the developing lung. We investigated pulmonary function in 32 patients (19 boys, 13 girls) surviving ALL who had completed treatment using consecutive standard protocols (BMF-type protocols).

The age at diagnosis ranged from 11 months to 14 years (mean 5 years). When investigated by this study they had completed treatment 3 to 16 years previously. A respiratory questionnaire revealed history of asthma, recurrent bronchitis, effort tolerance and active or passive smoking. A medical check up and a pulmonary function test using flow volume curves documented the respiratory status. Flow volume curves were obtained using a computerized pneumotachograph according to the guidelines of the American Thoracic Society. Of the 21 patients, 5 reported lower effort tolerance, 3 patients had a known diagnosis of asthma. In 2 patients, pulmonary function tests showed low values for vital capacity (72% and 73% predicted), both reported lower effort tolerance. One asymptomatic patient showed slightly reduced flow rates in the small airways (FEF 25= 62% predicted). In summary, pulmonary function testing in survivors of ALL is an important part of the long term follow-up in these patients. The aim is to protect especially patients with reduced lung function from further lung damage, eg. smoking (active or passive) or unrecognized asthma, to prevent chronic lung disease in adults.

PULMONARY BLASTOMA IN CHILDREN. CASE REPORT AND REVIEW OF LITERATURE. Solange Bongo[1], Carole Coze[1], Claudie Scheiner[1], Michel Coquet[2], Philippe Devred[1], Jean-Louis Bernard. [1]Fédération d'Oncologie Pédiatrique du C.H.R. de Marseille, Hôpital d'enfants de la Timone, Bd Jean Moulin (Marseille); [2]Fondation Saint-Joseph (Marseille).

Pulmonary blastoma is a rare malignant tumor. A new case is reported in a 3 year 6 month-old girl treated by surgery followed by chemotherapy. Clinical remission was obtained. A second look thoracotomy was performed and showed the persistence of a microscopic residual pulmonary disease. We then decided to deliver intensive chemotherapy followed by autologous peripheral blood stem cells reinjection. Problems set by the histogenesis of this tumor, its unspecified clinical and paraclinical features and the role of conventional and intensive chemotherapy are discussed with a review of the literature. This consolidation treatment was decided in order to increase the disease-free survival rate of our young patient, on account of the moderate percentage of remission obtained by conventional chemotherapy. One year after intensive chemotherapy, our young patient's clinical state is very satisfactory and the chest CT-scan images are stable, without suspect zones. Consolidation treatment by intensive chemotherapy followed by autologous peripheral blood stem cells reinjection has never been discussed for pulmonary blastoma in the literature. This treatment gives our study its original character, and its value needs to be appreciated on a long term follow-up.

BRONCHIAL CARCINOID TUMOR IN CHILDREN. A REPORT OF ONE CASE. M. Jorio Benkhraba, T.S. Benchekroun, B.S. Benjelloun,

C. El Mahraoui, A. Alaziz. Hôpital des Enfants, Unité de pneumo-allergologie, Rabat, Maroc.

We report one case of bronchial carcinoid diagnosed in one child who presented withdrawal bronchopneumonia and roentgenologic images refractory to antimicrobial therapy. Bronchial endoscopy disclosed a red, friable and hemorrhagic tumor which occluded the lumen of the intermediary trunk. The tumor was removed surgically and histological examination demonstrated its various immunochemical features. We review the clinical, roentgenological and endoscopic characteristics of carcinoid tumors. They belong to the APUD system because neurosecretory granules were demonstrated within tumor cells and endocrine secretion was analyzed by enzyme immunostaining techniques. Surgery is a choice of treatment allowing a complete removal of the tumor. These tumors with "low malignancy" rarely give rise to metastases especially in children. The survival rate is estimated at 80 to 90% for five years.

ASSOCIATION OF ALPHA-1-ANTITRYPSIN DEFICIENCY WITH NONSPECIFIC BRONCHOPULMONARY PATHOLOGIES AND PROTEASE INHIBITOR PHENOTYPES IN GEORGIAN CHILDREN POPULATION. R. Karseladze, H. Jamarjashvili, T. Churadze, V. Beridze. Institute of Pediatrics, Malikishvili 5, Tbilisi 380009, Republic of Georgia.

The bronchopulmonary apparatus is characterized by an effective, preventive system against pathological influence. Alpha-1-antitrypsin (α_1-AT) - protease inhibitor (Pi) plays a key role among many bronchopulmonary system prevention factors. Physicians attention was paid to Pi-system gene investigations, after observing the relationships between α_1-AT hereditary deficiency and non-specific bronchopulmonary pathologies (NBPP). We therefore used the Pi-phenotype method. The principle object of our work was to determine Pi genetic system predisposition to NBPP in the Georgian child population for exploration of scientifically proven recommendations for medical-genetic consultation, to select preventive individual-differential treatment of these pathologies and furthermore for its significant role in genogeographical studies. For determining α_1-AT deficiency, we used the isoelectrofocusing method in polyacrylamide gel (pH 4.4-5.2). We studied the Pi system in patients with Atopic Bronchial Asthma (ABA), broncoectasia, recurring and obstructive bronchitis, emphysema, down section emphysema and healthy subjects. We investigated 42 patients with NBPP, among them 52% had ABA, 3% - down section emphysema, 32% - obstructive bronchitis, 13% - with recurrent bronchitis, and a control group consisting of 82 children with same the age and nationality. The following results were obtained: 7% of patients had α_1-AT deficiency with the phenotype of the heterozygous form Pi-MZ appearing in 25%. Patients with ABA more often had phenotype Pi-MZ and only one with phenotype Pi-MZ had down section emphysema. Other special phenotypic distributions in the Georgian population were interesting as well. We frequently found Pi-M_1M_2 forms in Georgian healthy population as in other populations (12%). We gave M suballeles: M_1M_2, M_2M_3, M_1M_3, M_1M_4, M_2M_4, M_3M_4. For patients with hereditary α_1-AT deficiency, we used substitute therapy (enzyme inhibitors, inhalation with Aminokapron acid, Trassilol, Gordox, Amben) in complex treatment of these pathologies and effective results were obtained, compared to other methods of therapy - basic, laser, hormone and interferon. Specific criteria were used to define a method of therapeutic effect. Above-mentioned protease inhibitor genetic investigation give an opportunity to reveal risk-factors of pathology early and, in case of disease, to prescribe individual, substitute therapy. It will reduce illness and invalidity. These investigations promote medico-genetic consultation, initial prophylaxis and treatment.

RACHITIC LUNG (ABOUT 22 CASES). F. Souhail, B. Slaoui, R. Chami, F. Dehbi. Pédiatrie 2, Hôpital d'Enfants CH Ibn Rochd, Casablanca.

The authors report 22 cases of rachitic lung collected during 13 years in children aged three months to two years. The absence of prophylaxis by vitamin D was noticed in 20 cases. Among these children, 12 suffered from repeated respiratory infections and 14 showed signs of respiratory distress. A costal rope was present in 20 cases. A thoracic deformity consisting of an anterior projection of the sternum and a lateral costal depression was observed among 12 children. X-ray examinations showed as well variable signs of emphysema, atelectasis, pneumonia, thickening of the bronchial airways and multiple pulmonary infiltrates. The classic metaphyseal anomalies of rachitism were noticed among all of them. The blood gram-ion results showed a hypocalcemia that concerned 10 children. The treatment consisted of a remedial measure against hypocalcemia, an antibiotherapy and a vitamin D therapy. 20 patients greatly improved in health and the clinical and radiological signs disappeared. Unfortunately two children died. It proves how necessary prophylactic treatments are to prevent deficiency rachitism.

CLINICAL FEATURES OF PROLONGED PRODUCTIVE COUGH IN CHILDREN. C. Nakajima, Y. Yokoyama, T. Miyakawa, Y. Tsuchiya, C. Kijimoto. National Children's Hospital, Tokyo, Japan.

Some of the children with chronic cough may develop chronic bronchitis or bronchiectasis in the future. We studied the clinical features and the efficacy of treatment of children with prolonged productive cough to prevent them from developing chronic lung disease. Methods: We studied the characteristics and the duration of cough, past history, physical findings, chest roentgenographs of 51 patients with cough lasting more than 3 weeks in our hospital, then compared the clinical features of the patients with and without positive findings in physical examination or chest roentgenographs, and the efficacy of treatment of the patients with productive cough treated with and without physiotherapy. Results: There were 34 (67%) children with productive cough with physical or roentgenological positive findings, consisting of 18 boys and 16 girls whose ages ranged from 11 months to 7 years 3 months (median: 3 years 1 month). The duration of cough lasted from 3 weeks to 2 years (median: 10 weeks). The cough was prominent during the night and early morning. Forty-seven percent had wheezing besides the cough, and by auscultation had wheezes or coarse crackles. Eighty-eight percent had peribronchial shadows (PBS) or atelectasis on chest roentgenographs. Patients treated with physiotherapy had improved cough, physical and roentgenological findings significantly better than those without, but there was no remarkable difference seen between the patients treated with and without antibiotics. Conclusion: Most of the prolonged coughs in childhood are productive with concomitant physical or roentgenological findings. Physiotherapy was most effective for these patients suggesting that the first choice of therapy for prolonged productive cough is to eliminate standing sputum from the bronchi in childhood.

NASAL INTERMITTENT POSITIVE PRESSURE VENTILATION (NIPPV): ALTERNATIVE TO MECHANICAL ASSISTED VENTILATION VIA TRACHEOSTOMY FOR NEUROMUSCULAR DISEASES WITH RESTRICTIVE RESPIRATORY FAILURE (RRF). A Sentilhes, MC Commare, L Viollet, B Estournet-Mathiaud. Service de Réanimation Pédiatrique, Hôpital Poincaré, Garches, France.

Aim: Does NIPPV avoid tracheostomy in patients with RRF and in which indications? Patients and Methods: A retrospective study on children followed for RRF and managed with NIPPV was performed in the pediatric intensive care unit. Judgment criteria was the realization of a tracheostomy. Other data collected were: - neuromuscular disease possibly Spinal Muscular Atrophy (SMA) or Stable or Slowly Evolutive Myopathy (SSEM) except Duchenne Muscular Dystrophy; - sex; - criteria for NIPPV possibly spinal arthrodesis, chronic hypercapnia twice measured more than 6.5 KPa out of acute respiratory failure, recent respiratory worsening defined as a stable decrease of the forced vital capacity, recurrent and severe weakness; - duration and standing of NIPPV. Results: NIPPV was instituted since 1988 on 43 children (26 SMA, 17 SSEM). Sex-ratio was M:F:1:1.5. Median age at the beginning of NIPPV was 10.9 (range 1-30). Median duration of NIPPV was 24 months (range 1-89). Criteria for NIPPV were: hypercapnia in 16 cases (37.2%) (12 SSEM, 4 SMA), respiratory worsening in 21 cases (48.8%) (18 SMA, 3 SSEM) and arthrodesis in 6 cases (14%) (3 SMA, 3 SSEM). On December 31,1995, tracheostomy was performed on 13 children (30.2%). Their median duration of NIPPV was 18 months (range 6-35). In the group with NIPPV (69.8%), all but two are continuing with a median duration of 33 months (range 0-89). When NIPPV criteria was hypercapnia, tracheostomy was performed in 50% of cases (7 SSEM and 1 SMA). When NIPPV criteria was respiratory worsening, tracheostomy was performed in 23.8% of cases (4 SMA and 1 SSEM). In the arthrodesis group, there were no tracheostomy done. Conclusion: NIPPV criteria is most often hypercapnia in the SSEM group and respiratory worsening in the SMA group. Maintaining a functional cough and suffering very little from recurrent pneumoniae, SSEM children present few respiratory symptoms. Their functional autonomy could explain hypercapnia as a late event of their respiratory insufficiency. In this group, NIPPV could be introduced too late. Earlier, NIPPV and Inspiratory Aid Mode might optimize the quality of life on these patients.

SEQUENTIAL MATURATION OF THE INTESTINAL AND BRONCHIAL MUCOSAL BARRIERS IN INFANTS DECEASED OF SIDS. J. El Kaissouni, G.C. Fauré, S. Thionnois, P. Monin, M.C. Bene. Laboratoire d'Immunologie, Fac de Médecine & CHU, Hôpital d'enfants, Nancy, France.

The study of the mucosal immune system sequential maturation in infants is not easy to perform in man for ethical reasons. Therefore, few elements are known about this maturation. The opportunity of autopsy which are systematically performed in France for infants deceased of Sudden Infant Death Syndrome (SIDS), provides an access to intestinal and bronchial tissues. Tissue samples of 62 children who died between a few minutes to 4 months of age were collected at autopsy, snap-frozen in liquid nitrogen and maintained at -80°C until studied. Serial frozen-cut sections (4 µm) were performed at -30°C, fixed for 45 seconds in a microwave oven and used for histological and immunohistological studies with antibodies to the Secretory Component (SC), IgG, IgA and IgM as well as with monoclonal antibodies against HLA-Class II antigens and against the adhesion molecule CD54. Epithelial cells were brightly stained for the secretory component in all samples. The most abundant producing cells were of IgA or IgM isotype. Small numbers of these cells were detectable in the gut during the first week of life, and slightly later in the bronchial mucosa. Nevertheless, their numbers increased rapidly to reach similar levels in the two areas by week 8 of age for IgM and by week 9 for IgA. The mean numbers of plasma-cells where then stable, with approximately three times more IgA-containing cells than IgM-containing cells. The size of lymphoid nodules increased rapidly, and fully structured germinal centers could be found in the gut samples by week 1. Endothelial cells showed a bright expression of CD54 and HLA-Class II molecules suggesting an active involvement of blood vessels in cell trafficking at early stages of development. In conclusion, this study provides new information on the maturation of mucosa defenses in the upper respiratory tract, and a sequential approach of this maturation in the small intestine.

PULMONARY SEQUESTRATIONS (14 CASE REPORTS, OF WHOM 11 HAD PRENATAL DIAGNOSIS AND 2 PRENATAL TREATMENT). F. Becmeur, L. Donato, B. Gasser, M. Dreyfus, L. Marcellin, I. Chevalier, R. Favre, A. Born. Hôpitaux Universitaires de Strasbourg.

Fourteen children have been followed during the past six years for pulmonary sequestration (PS). There were 10 boys and 4 girls, born at term (38 weeks). Twelve had surgery. Eleven had a prenatal diagnosis: an intrathoracic malformation was suspected in 7 cases, and PS was correctly diagnosed in 4 cases. The prenatal diagnosis was made between 20 and 33 weeks (average = 26 weeks). Two fetuses were treated: a pleura-amniotic drainage (1 case), aspirations of ascots and amniotic fluid (1 case). The postnatal diagnosis was confirmed with MR (9 cases). Mean age for surgery was 4 months (from 1 day to 13 months) with a prenatal diagnosis, and 5.5 years without any prenatal diagnosis. Thoracoscopy was attempted 4 times without any success. We found 8 extralobar sequestrations (ELPS), and 6 intralobar sequestrations (ILPS). The systemic artery arisen from the thoracic aorta (6 cases), or from the abdominal aorta (6 cases). Two ELPS were inserted between an accessory diaphragm and the normal diaphragm. An anomaly of bronchus segmentation was discovered in the lung opposite to the PS, in two cases (bronchoscopy). In 6 cases, there were coexisting malformations consisting of a diaphragmatic hernia, various vascular malformations, hypoplastic lungs. Spontaneous regression of antenatally diagnosed PS has been observed. MRI is a good and non invasive diagnostic procedure. Large size PS (more than half an hemithorax), must be operated on. When a mediastinal shift or other compressive thoracic signs are described in the fetal chest, a prenatal treatment may be done. These PS must be proposed for early surgery. Medium-sized lesions must be operated. Small and asymptomatic PS are to be operated on when they are intralobar forms (often cystic PS), or extralobar but cystic, or ILPS or ELPS but with a big aberrant vessel. This artery may be responsible for severe complications (hemoptysis, aneurysm).

THE MELBOURNE HOUSE DUST MITE STUDY: ELIMINATING HOUSE DUST MITE IN THE DOMESTIC ENVIRONMENT. D.J. Hill, P.J. Thompson, G.A. Steward, A.S. Kemp, C.S. Hosking, J.B. Carlin, T.M. Nolan. Department of Allergy, Royal Children's Hospital, Melbourne, Victoria, Australia.

Hypersensitivity to house dust mite allergens is associated with increased asthma severity and morbidity. Aims: To assess the effect of different mattress covers and carpeting of floors on mite allergen concentrations over a prolonged period. Methods: In 107 dwellings, the concentration of Der p 1 was measured on mattress covers, mattress surfaces, carpeted and uncarpeted floors of children's and parent's bedrooms, and living rooms on 3 occasions over 5 months. After the first sampling all mattress covers were permanently removed. Der p 1 concentrations were determined using ELISA. Results: The initial geometric mean concentrations of Der p 1 from the surfaces of sheepskin, wool, and cotton mattress coverings were 115.9, 113.2 and 19.3 µg/g of dust and 142.3, 40.0 and 19.8 µg/g on the underlying mattress surfaces. Der p 1 levels on mattresses with plastic covers were < 2 µg/g of fine dust on the mattresses and remained low after plastic encasements had been removed for 5 months (3.4 µg/g of fine dust). In uncarpeted rooms the geometric mean Der p 1 level was less (usually < 2 µg/g of fine dust) than carpeted rooms (always > 10 µg/g of fine dust) irrespective of whether adjacent rooms were carpeted or non-carpeted. Conclusion: In Melbourne, Der p 1 levels on non-carpeted floors and on plastic encased mattresses were consistently below the reported threshold levels for sensitization. These findings have major public health implications.

THE QUEBEC ASTHMA EDUCATION NETWORK (QAEN) ACTION PLAN (PEDIATRIC SECTION). Rachel Rouleau[1], Louis-Philippe Boulet[2], André Cartier[3], Jean-Paul Praud[1]. [1]Centre Universitaire de Santé de l'Estrie, Sherbrooke; [2]Hôpital Laval, Ste-Foy; [3]Hôpital du Sacré-Coeur, Montréal, Québec, Canada.

One of the QAEN's goals is to teach asthmatic children and their parents how to become involved in asthma care. The QAEN wishes to decrease asthma related mortality, morbidity and school or work absenteeism by more than 30% and reduce the financial impact of asthma on the health system. Methods: The network's means to achieve its goals are: by establishing education centers in all Québec regions, training specialized educators in asthma and other health professionals, developing structured education programs on asthma, promoting asthma support groups as a complement to teaching and measuring the effect of these interventions on the asthmatic population. Preliminary evaluation: A preliminary study showed that a substantial reduction of 64% in the number of hospitalizations, 47.2% in visits to the emergency department and of 75.9% in work absenteeism in adult asthmatics could be reached with the implementation of the QAEN program. Based on those results, it was estimated that this initiative could result in an economy of 7 millions CAN $/year for the Québec health system and 7.3 million $ for the private sector if it reaches about 50% of the asthma population. Conclusion: The QAEN is a provincial initiative aiming at making available uniform and effective asthma education programs to health professionals and asthmatic patients. Further work is currently done to determine how to achieve maximal cost/effectiveness.

A NEW CONCEPT OF FACIAL MASK FOR PEDIATRIC CHRONIC VENTILATORY SUPPORT. I. Desguerre*, B. Duboc**, T.T.H. Trang***, H. Siouti**, D. Ginisty**. *Service de Neuropédiatrie du Dr.Ponsot, Hôpital St.Vincent de Paul 75014 Paris, Faculté de Médecine Paris V. **Service de Chirurgie Maxilofaciale et Stomatologie Pédiatrique du Pr Ginistry, Hôpital St-Vincent de Paul 75014 Paris, Faculté de Médecine Paris V. ***Service de Physiologie, Laboratoire d'Explorations Fonctionnelles du Pr Gaultier, Hôpital Robert Debré 75019 Paris.

We report our experience of a new type of facial mask in a series of ten children from 1.5 to 17 years old with ventilatory support delivered by nasal interface during sleep. Because of a severe chronic obstruction of the airways, five children are ventilated with positive assisted pressure (ventilator MORPHEE). These children are affected with picnodysostisis (2 cases), achondroplasia (1 case), severe Robin, syndrome with Moebius syndrome (1 case) and severe glossoptosis (1 case). Alternatively, the five other children were derived from an Intermittent Positive Pressure Ventilation (IPPV) which is delivered via a nasal mask (Ventilator EOLE). Clinically, these children are affected with anterior spinal amyotrophies type II (2 cases), congenital myopathy (1 case), and hypothalamic syndrome with central hypoventilation (2 cases). We try to improve the properties of a facial mask because of the difficulties linked with cutaneous erosion problems, instabilities and leakage of standard nasal mask during operation. We performed a facial impression, made of Alginate, to create a custom-made mask with large frontal and perinasal supports. The stability of the mask is improved in absence of pressure exercised on the child's face. The consequence is a better quality of ventilation and of sleep associated with optimal maxillary and facial growth.

TREATMENT OF SEVERE STEROID DEPENDENT CHILDHOOD ASTHMA WITH IVIG. P. Taprantzi, E. Syrigou, H. Zervaki, E. Andriani, C. Sinaniotis, F. Saxoni-Papageorgiou. 2nd Dept. of Pediatrics, University of Athens, "A. & P. Kyriakou" Children's Hospital, Athens, 115 27 Greece.

Three children (two atopic and one non atopic), aged 13-16 years, with long-standing steroid dependent asthma participated in an open trial with intravenous immunoglobulin (IVIG). IVIG was given as monthly infusions with a dose of 0.4 g/kg body weight for 15 months. The number of asthma attacks/month, pulmonary function (PEFR and FEV_1) and the mean dose of systemic corticosteroids/month were evaluated before and after IVIG administration. During the preceding year, all children had perennial daily symptoms, poor activity and school performance with an average of more than one asthma exacerbation/month. Their asthma therapy required daily use of 10 mg of oral corticosteroids with short courses of high doses in addition to regular use of inhaled corticosteroids, inhaled bronchodilators, theophylline and cromolyn sodium. Following IVIG administration, significant improvement was observed in all parameters, beginning after the fourth infusion. Pulmonary function (PEFR and FEV_1) increased by 25%. The asthma attacks decreased to < 1 per 3 months and the mean oral steroid dose from 235 mg/month to 30 mg/month. IVIG was well tolerated with the exception of one child who experienced severe headache following the first infusion. In conclusion, our data suggest that prolonged administration of low dose IVIG is safe and may be effective in reducing asthma attacks and systemic corticosteroid use in severe steroid dependent childhood asthma.

IGG-SUBCLASSES ADD LITTLE TO THE DECISION OF I.V. GAMMAGLOBULIN REPLACEMENT THERAPY IN CHILDREN WITH RECURRENT RESPIRATORY INFECTIONS. S.T. Remes and M. Korppi. Department of Pediatrics, Kuopio University Hospital, Finland.

IgG subclass deficiency has been suggested to predispose recurrent respiratory infections. The frequency of IgG subclass deficiency in 172 children, who visited our hospital or outpatient clinic because of recurrent infections between the years 1988-1992 was evaluated. Serum immunoglobulins (Ig) A and G were measured in addition to IgG subclasses in all children. Most children were less than 4 years old. Serum total IgG was slightly decreased in one case. A decreased IgA value was present in four children; none of them had complete deficiency. IgG subclass concentrations were decreased in 73 children (42%). However, significant decrease (< 50% of the lower limit of the age-related reference value) was present in only 17 children (10%); IgG1 was decreased in 2, IgG2 in 9, IgG3 in 2 and IgG4 in 5 children. An intravenous gammaglobulin treatment (400 mg/kg 4-12 times at 3 week intervals) was considered as clinically indicated in 11 children; 5 had moderate and 5 significant IgG subclass deficiency. Both IgG2 and IgG4 were significantly decreased in one, IgG2 alone in two and IgG4 alone in two children. Ten children had suffered from recurrent otitis media. One seven-year old boy had suffered from chronic otitis and sinusitis. Nine patients had suffered from at least two episodes of pneumonia. The treatment was regarded as clinically effective in 7 children. In conclusion, slightly decreased IgG subclass concentrations are common but significant deficiency is rare in children with recurrent respiratory infections. A low IgG subclass value alone is not an indication for IVIG therapy. In correctly selected patients with clinically significant problems such therapy may be beneficial.

INFLAMMATORY CYTOKINE AND IMMUNOGLOBULIN LEVELS IN NASAL SECRETIONS OF PATIENTS WITH PRIMARY IMMUNODEFICIENCIES. B. Friedrich, I. Bühring, T. Zollner[1], S.W. Bender[2], S. Zielen. Dept. of Pediatrics and Dept. of Dermatology[1], J.W. Goethe-Universität 60596 Frankfurt, Germany and Dept. of Pediatrics[2], Deutsche Klinik für Diagnostik, 65191 Wiesbaden, Germany.

Upper respiratory tract infections are characteristic for patients with humoral immunodeficiencies. Despite pharmacological intervention and immunoglobulin therapy, chronic sinusitis and nasal polyps develop. This prompted us to study inflammatory cytokines (ECP, IL-8 and TNF[pg/ml] and immunoglobulin levels [µg/ml] in nasal secretions of 9 patients with common variable immunodeficiency (CVID) under constant substitution, 7 with IgA deficiency and 14 age matched controls (C). Under replacement therapy, median IgG and IgM concentrations of patients with CVID and controls showed no significant differences. In contrast, inflammatory cytokines were clearly elevated in CVID demonstrating an ongoing inflammation at the mucosal level. In patients with IgA deficiency, IgG and IgM levels were significantly elevated compared to controls and CVID suggesting that low levels of IgA are compensated by IgM and IgG at the mucosal level. According to these findings, immunoglobulin replacement therapy with 400-500 mg/kg every 3 weeks is not sufficient to prevent chronic inflammatory damage at the mucosal level in CVID. Additional medication with either topical steroid and/or antibiotics has to be considered.

	CVID	IgA↓	C	CVID→C	IgA→C	CVID→IgA
IgG	2.49	7.56	2.08	n.s.	0.031	0.038
IgM	0.70	3.6	0.37	n.s.	0.0013	0.007
sIgA	0.7	0.05	17.15	0.01	0.0003	n.s.
IL-8	2436	959.3	212.2	0.0002	0.021	0.05
ECP	33000	9330	1500	0.0008	n.s.	n.s.
TNF	37.31	5.45	3.77	0.0012	n.s.	n.s.

CHRONIC COUGH IN PATIENTS WITH PRIMARY IMMUNODEFICIENCIES. I. Bühring, B. Friedrich, J. Schaaf[1], H. Schmidt[1], W. Kreuz, S. Zielen. Dept. of Pediatrics and Dept. of Radiology[1], J.W. Goethe-University, 60596 Frankfurt/M., Germany.

Despite regular immunoglobulin replacement therapy, chronic cough due to postnasal drip remains an important problem in patients with primary immunodeficiencies. The efficacy of common therapeutic strategies is questionable. In an open trial, we evaluated the therapeutic efficacy of Azithromycin, Acetylcystein and topical intranasal Beclometasone in a course of 6 weeks in 16 patients with primary immunodeficiencies (common variable immunodeficiency syndrome n=11, Ataxia teleangiectasia n=3, X-linked Agammaglobulinemia n=2. MRT scans were performed before and after treatment to seize morphological changes and in addition inflammatory mediators (IL-8, TNF-alpha) were measured in secretions after nasal washings prior to and after therapy. MRT scans revealed chronic infection of the maxillar sinuses in all patients. Additionally in 5 patients chronic infection of the ethmoidal and frontal sinuses was recorded. The inflammatory cytokine IL-8 in nasal secretion was significantly elevated in patients, median 2436 pg/ml vs age-matched healthy controls, median 212 pg/ml ($p < 0{,}0001$). In spite of long-standing therapy, clear improvement of chronic sinusitis was only achieved in 2 patients. In the majority of patients, therapy was of no benefit. There was no significant decline in levels of inflammatory cytokines either, the median of IL-8 after therapy was 1141 pg/ml. Our results demonstrate that conservative therapy of sinusitis is of little effect in patients with primary immunodeficiencies. Ultimately one will have to proceed to a combined conservative and surgical therapy to cure chronic sinusitis for prevention of postnasal drip in these patients.

DIFFICULTIES IN THE DIAGNOSIS OF PNEUMOCYSTOSIS IN CHILDREN. Krystyna Rowecka-Trzebicka[1], Anna Dobrzanska[1], Barbara Kassur-Siemienska[1], Ewa Augustynowicz[2], Jacek M Witwicki[1].
[1]Newborn and Infant Care Department and [2]Department of Microbiology of Child's Health Center, Warsaw, Poland.

As the number of people with acquired and congenital immunodeficiency syndromes increases, Pneumocystis carinii (Pn. c.) has attracted widespread interest as the leading cause of fatal opportunistic infections. This is why new methods of early diagnosis must be introduced. At autopsy, characteristic changes of pulmonary tissue in Pn. c. infection are demonstrated or different stages of parasite evolution (cysts, trophozoites) are shown with the help of electron microscopy. The incompletely developed immune responsiveness and the immaturity of the respiratory tract makes the evaluation of the test results difficult. Neither the clinical manifestations nor the laboratory tests (radiological, biochemical, specific serologic tests) are characteristic in young children. Definite diagnosis is made by demonstrating the presence of trophozoites and cysts of Pn. c. by appropriate staining of BAL aspirates. Because of technical difficulties in obtaining the biological material in the youngest children, the authors have tried to evaluate the usefulness of the PCR (Polymerase Chain Reaction) method in the saliva of infants in the diagnosis of the infection. Preliminary results indicate that it is possible to use the PCR method in the early diagnosis of pneumocystosis in children thus enabling early introduction of treatment and full therapeutic success. (Grant of the Scientific Research Committee (KBN) Grant Nr PB 87/P05/95/08).

USE OF AMINOCAPROIC ACID IN CHILDREN WITH ACUTE RESPIRATORY VIRAL INFECTIONS. N. Sapanadze, K. Nemsadze, P. Kherkheulidze. Dept. Of Pediatrics, Tbilisi State Medical University, Republic of Georgia.

Acute respiratory viral infection (ARVI) is the most frequent respiratory disease in childhood. The incidence of ARVI and it's complications appear to have increased tendency over past years world-wide. Severity of the process causes destabilization of the red blood cell's (RBC) membrane, so it appears interesting to use different membrane stabilizers in addition to traditional treatment. Aminocaproic acid (ACA) was used in 120 children with ARVI. Combination of ultrasound devices (UZ-21 and AEROTERA-01) was used for 8% ACA inhalation or it's per os administration in children without complications and intravenous injection of ACA (2ml/kg) was used in children with complications. Children of the control group received placebo instead of ACA. Resistance of RBC membrane and hemolytic activity were studied in both groups of children. The results showed high effectiveness of inclusion of ACA into the treatment of ARVI in children. Significantly decreased resistance of RBC membrane and increased speed of hemolysis which were positively correlated with the severity of disease and with the development of purulent inflammatory complications (bronchitis, pneumonia, sepsis) were normalized more rapidly compared to controls. Moreover, they had more rapid clinical remission and minimal signs of toxicosis (hospital stay 5-7 days vs. 12-14 days in control group, $P<0.001$). We conclude that inclusion of aminocaproic acid into the treatment of children with ARVI is effective and should be widely used in clinical practice in the future.

INFLUENCE OF PLAFERON LB ON IMMUNOLOGICAL PARAMETERS IN CHILDREN WITH ACUTE RESPIRATORY VIRAL INFECTION, COMPLICATED WITH ENCEPHALOPATHY. M. Kerkheulidze, N. Manjavidze, L. Bakhutashvili, P. Kherkheulidze, State Medical University, Tbilisi, Republic Of Georgia.

Inculcation of new drugs in treatment of acute respiratory viral infection (ARVI) is one of the main problems of pharmacology. The new immunomodulator (Plaferon LB) obtained from human placenta and containing physiologically active substances was used in 100 infants with ARVI complicated by encephalopathy. Patients were divided into 2 groups: 1- Plaferon LB was used by daily intramuscular injections (0.05 mg/per kg) once a day, during 7-10 days, paralleled with traditional treatment; 2- Group was treated only with traditional methods (control). Different immunological parameters (immunoglobulins by Manchiny, T cell subpopulations by monoclonal antibodies, interferon reaction of leukocytes) were investigated. In contrast to traditional therapy, addition of Plaferon LB caused improvement of the general condition of T lymphocytes especially in the T helper subpopulation, as well as production of interferon by leukocytes and clinical picture of the disease (diminished number of super or reinfection, duration of hyperthermia and disorders of nervous system, increased number of cases with effective treatment). We concluded that Plaferon LB plays an important role in immune rehabilitation of infants with ARVI complicated with encephalopathy and should be widely used in clinical practice.

THE PREVALENCE OF CHILDREN ACUTE VIRAL RESPIRATORY INFECTION IN REPUBLIC OF GEORGIA. N. Manjavidze, M. Kerkheulidze, L. Mkheidze, M. Tsiklauri, Tbilisi State Medical University, Republic of Georgia.

Over the last few years, the number of children with acute viral respiratory infection (AVRI) and it's different complications have had a tendency to increase worldwide. Recently WHO and UNICEF announced the problem of AVRI to the National Committee for Children's Care of the Rep. of Georgia as one of the main priorities. The purpose of our study was to evaluate etiological structure of AVRI in Georgian children during 1992-1994. 454 patients (from 2 to 15 years old) were investigated and different methods (serological, immunoenzymatic, radioimmunoassay, hemaglutination, fixation of complement, etc.) were used. The results showed that during the last years the number of children with RS viral infection was significantly increased, while adenoviral and influenza infection decreased compared to 1989-1991. Adenoviral infection was identified in 19,5% of cases, influenza virus - 18,5%, RS virus - 9,6%, parainfluenza - 21,5%, rheovirus - 1,2%, enterovirus - 2,8%, rhinovirus - 2,1%, mixed viral infection - 6,2% and in 18,7% of cases, viral infection was not identified. It should be emphasized that parainfluenza more often caused disorders of the upper respiratory tract (laryngo-tracheitis, laryngostenosis, syndrome of Croupp), while RS virus was observed in most cases with bronchoconstriction, and influenza in children complicated by encephalopathy and/or other disorders of the nervous system The main causes of viral pneumonia were adenoviral, RS infection and influenza. Therefore, during the last years, RS infection was significantly increased as well as bronchoconstriction compared to the period of 1989-1991.

SERUM INTERFERON-ALPHA (INF-α) AS A MARKER OF VIRAL LOWER RESPIRATORY TRACT INFECTIONS IN CHILDREN. D. Gendrel, F. Moulin, J. Raymond, J.L. Iniguez, S. Ravilly, P. Lebon. Hôpital Saint-Vincent-de-Paul, Paris, France.

During childhood respiratory tract infection, the diagnosis of viral versus bacterial infection remains difficult at the initial phase of the disease. We have studied retrospectively INF-α in sera collected at the acute phase of lower respiratory tract infection in 140 children (15 days to 13 years) with fever and respiratory symptoms. In all cases the causative agent was identified (*B. pertussis* and viruses from pharyngotracheal aspirate, bacterial pathogens from blood culture, antibodies on paired sera for some viruses and *Mycoplasma pneumoniae*). IFN-α was measured in a biological assay using MDBK cells. Number of positive results (> 2UI/ml)/Number of tested patients was: **Bacterial pathogens: 4/63 (6.3%):** *S. pneumoniae* 1/13, *H. influenzae* 0/5m *B. pertussis* 0/4, *St. aureus* 0/1, *M. pneumoniae* 3/40. The 4 children with bacterial infection and positive INF-α had a coinfection with viruses (Sp + RSV: 1; Mp + Parainfl: 2; Mp + EBV: 1). **Viruses: 61/77 (79,2%):** Resp Sync Virus: 38/50, Adenovirus: 9/10, Parainfluenza: 10/13, Influenza: 2/2, EBV: 2/2. INF-α production was the same (mean and number of positives) according to age (> 3 months, 3 to 12 months and > 12 months). The specificity of the test was 95% with a sensitivity of 81%. The presence of serum IFN-α in this study is an important marker of respiratory viral infection. Further prospective studies are needed, but serum IFN-α assay could be a useful diagnostic aid in the acute respiratory infection in childhood, and could contribute to reduce antibiotic use.

TWO CASES OF PRIMARY IMMUNODEFICIENCY WITH PROGRESSIVE RESPIRATORY FAILURE FROM BRONCHIECTASIS. T. Goshima[1], T. Kato[1], N. Nakajima[1], C. Kijimoto[2], E. Ueno[3], Y. Koizumi[4], and M. Bamba[4]. [1]Dept. of Pediatrics, St. Marianna University, School of Medicine, Kanagawa, Japan; [2]National Children's Hospital, Tokyo, Japan; [3]Shizuoka Red Cross Hospital, Shizuoka, Japan; [4]Keio University School of Medicine, Tokyo, Japan

We experienced 2 patients with both hypogammaglobulinemia and T cell dysfunction who presented with progressive respiratory failure. Case 1 is a 14 year old female with multiple episodes of hypocalcemic tetany. The patient had been diagnosed as partial DiGeorge syndrome due to her distinctive facial feature, congenital cardiac disease and T cell deficiency. After 8 years she had developed hypogammaglobulinemia and bronchiectasis. Bronchiectasis was progressive and she died of respiratory failure at the age of 14 years in spite of gammaglobulin replacement therapy and administration to prevent the infection disease. Case 2 is a 19 year old female with multiple episodes of lower respiratory and dermatological infections. At 12 years of age, she had hypogammaglobulinemia along with a low number of CD4 cells, poor blastogenic responses and increased NK cell activities. She was diagnosed as having common variable immunodeficiency and was placed on gammaglobulin replacement therapy, however, she died from respiratory failure from progressive bronchiectasis at the age of 19 year old. Conclusion: In primary immunodeficiency patients with hypogammaglobulinemia with T cell dysfunction, immunological treatment at the early stage of the disease is important because the lower respiratory infection has the tendency to be severe.

CLINICAL VARIETIES OF KARTAGENER'S SYNDROME IN CHILDREN. S. Yu. Kaganov, N.N. Rizinova, M.B. Kerimov. Science Research Institute of Pediatrics and Child Surgery, Ministry of Public Health of Russian Federation, Moscow, Russia.

The long-term observation of 57 children with Kartagener's syndrome was performed. The data shown indicate different patterns of pulmonary changes in Kartagener's syndrome. Bronchiectases were not the obligatory symptom. We found no coloration between clinical manifestations of the disease and the pattern of bronchopulmonary changes and the type of ultrastructural defect of the ciliary exonemes. It was shown that Kartagener's syndrome can exist in children in combination with different congenital abnormalities of the lungs or other systems. We observed the "classic" Kartagener's syndrome and the primary ciliary diskinesya without situs viscerus inversus within one family. The long-term observations (approximately 15 years) demonstrated that the prognosis in Kartagener's syndrome as well as the clinical pattern of the disease depend of the nature and the pattern of morphological changes in the lungs. The woman with Kartagener's syndrome may retain childbearing function.

GENETIC ANALYSIS OF PRIMARY CILIARY DYSKINESIA (PCD). MG. Meeks, E. Chung, R.M. Gardiner, A.M. O'Rawe. The Rayne Institute University College Hospital, London WC1E6JJ.

Primary ciliary dyskinesia, PCD, has an estimated incidence of 1/15 000 and is characterized by clinical features of recurrent sinopulmonary infections, bronchiectasis and infertility in males. Kartagener's syndrome is the term used to describe primary ciliary dyskinesia in association with situs inversus. Affected individuals show a variety of ultrastructural abnormalities of their cilia including absent dynein arm, absent radial spokes, supernumerary microtubules and random ciliary orientation. A familial incidence is well recognized and most families show an autosomal recessive mode in inheritance although families appearing to show autosomal dominant inheritance are well described. The wide variety of ultrastructural defects suggests that there is genetic heterogeneity probably both at the locus and allele level. The gene frequency is estimated as 1/65. Initial efforts to identify genetic loci use linkage analysis of candidate gene regions. Ushers syndrome has been shown to be associated with structural defects of the axoneme and also to coexist in a number of patients with PCD. The Usher loci (USH1A:14q32, USH1B:11q, USH1C:11p) are therefore candidate gene regions. A total of 11 families with well characterized ultrastructural abnormalities of the dynein arm have undergone preliminary linkage analysis. At the Usher 1 locus on chromosome 14, Genomic DNA from 50 individuals (including 22 affected) was amplified using the fluorescently labeled oligonucleotide primers flanking the microsatellite loci D14S51, D14S78 and D14S250 in the Usher 1A region. Linkage analysis was performed using the MLINK program of the LINKAGE package assuming an autosomal recessive mode if inheritance, a penetrance of 80%, a disease allele frequency of 0.01 and a phenocopy rate of 0.002. Negative pairwise lod scores of less than -2 at each locus confirms exclusion of linkage to the USH1A region on chromosome 14q32 in this group of families. A genome search has now been initiated using homozygosity mapping in a group of consanguineous families.

RANDOMIZED DOUBLE BLIND CONTROLLED TRIAL ON NEBULIZED BUDESONIDE FOR CHILDREN ADMITTED TO HOSPITAL WITH CROUP. C.W. Godden, M.J. Campbell, J.J. Cogswell. Poole Hospital NHS Trust, Poole, Dorset, England.

The objective of the trial was to determine whether nebulized Budesonide improved the symptoms or shortened the duration of stay in children admitted to hospital with a diagnosis of croup. Patients were randomized to receive a nebulized solution of either 2 mg of Budesonide or 4 ml of normal saline on entry to the trial and later to receive every 12 hours either 1 mg of nebulized Budesonide or 2 ml of normal saline. A croup score which included clinical observation and oximetry was performed on admission, at 30 minutes, one hour, two hours, four hours and then four hourly until discharge. The outcome measures were the duration of in-patient stay and the croup scores at 30 minutes, one hour, two hours, four hours, twelve and twenty-four hours. During the 17-month study period, there were 123 admissions to hospital with a diagnosis of croup and 89 of these entered the trial. Eleven doses of Adrenaline were administered to the controls and four doses to the treatment group. Two patients, both in the control group, required intubation for worsening respiratory obstruction. Budesonide was associated with a 33% reduction in the length of stay (p 0.038) and a significant improvement in symptoms at twelve hours (p 0.006) and twenty-four hours (p 0.006). In conclusion, nebulized Budesonide is an effective treatment for children admitted to hospital with a clinical diagnosis of croup.

A LESSON FROM IMMUNOPHENOTYPING OF THE LUNG TISSUE INFILTRATE IN PNEUMOCYSTIS CARINII INFECTION IN CHILDREN. B. Kassur-Siemienska[1], W.T. Dura[2], W. Grajkowska[2], M.J. Gladkowska-Dura[2], K. Rowecka-Trzebicka[1], M. Migdal[3]. [1]Dept. of Neonatal Pathology; [2]Dept. of Pathology and [3]Intensive Care Unit, Children's Memorial Health Center, Warsaw, Poland.

Introduction: Pneumocystis carinii (PC) infections attract increasing interest as a common complication of a spectrum of immunodeficiencies in children. As any parasitic infection, PC is preceded by polymorphic, histiocytic and lymphoid T-cell infiltrate followed by *in situ* expression of mainly Th_2 cytokine profile, and finally by end-stage IL-6 dependent plasma cell infiltrates. This, together with intraalveolar exudate, are considered as a main cause for alveolar-capillary block and asphyxia if untreated. Patients and methods: The study analyzed the immunophenotype of inflammatory infiltrate in lung tissues from 4 children who died due to PC infections. All were diagnosed as PC infected based on seropositivity and PC findings in BAL. At the time of autopsy, all presented spectrum of thymic pathology ranging from "dysplasia" to severe thymic atrophy. Study was based on APAAP technique and use of 18 Mabs including those imaging TCR chains on T cells. Attention was focused on whether there were any topography related (bronchi versus alveolar spaces) immunophenotypic specificity and whether Ly phenotype may determine duration of illness. Results: Findings were grouped into three broad categories. **First,** Ig phenotype in topographically prevailing plasma cell infiltrate was of IgM isotype with few CD20+, CD45RB+ B cells and very few CD43+, UCHL-1+, CD3+ TCR γδ+ which did not express CD4 or CD8 chains. **Second,** in the area where predominant cell infiltrates consisted of only Ly cells, prevailing phenotype was that of T cells expressing TCR γδ chains, half of them were UCHL-1+, CD3+/CD8+, few CD57+ (NK-cells) and CD4+ which showed TCR γδ+ chains. Those areas were also rich in CD68+ or CD14+ histiocytes and extensive increase in pneumocytes as delineated by anti-cytokeratin Mab. **Third,** predominant T cell phenotype of peribronchial and mucosal Ly was that of CD3+/CD8+ with TCR expressing almost exclusively γδ chains. Conclusion: Phenotypic study suggests that predominant T-cells involved in PC infection are of "intestinal type" showing γδ constituents of TCR and not αβ as observed usually in bacterial pneumonia. A prospective study evaluating cytokine and specific TCRVγ and TCRVδ chain profiles is proceeding now in order to define whether assessment of TCR phenotype on Ly in cytological preparation of BAL may serve as an aid in diagnosis and/or prognosis. Supported by: Committee for Scientific Research (KBN) grant nr PB 287/p05/95/08.

PNEUMOCYSTIS CARINII IN NORMAL AND IMMUNO-SUPPRESSED CHILDREN. T.S. Parulava, D. Devdariani. Medical Academy, Tbilisi, Georgia.

80 instances of Pneumocystis carinii infection were recognized between 1984-1994. Pneumocystis carinii was identified in cytological demonstration of preparations stained with Giemsa, Gomoris, Toluidine blue technique or by indirect immunofluorescence of sputum, swabbed specimens from hypopharynx and tracheal and bronchial aspirates. In two cases, the diagnosis was established only at autopsy. The studies indicate that pneumocystis pneumonitis were most common in compromised hosts. Diffuse pneumonitis was provoked by extensive use of immunosuppressive agents or severe states of immunodeficiency (41 cases). Pneumocystis carinii infection occurred also with high frequency in normal children. In normal host, Pneumocystis carinii is of low virulence and host resistance must be impaired before the parasite can produce clinically manifested disease. In children with temporary, mild immunosuppression (39 cases), we found atypical manifestation. Disease began with upper respiratory tract symptoms, fever was absent or low grade. Clinical picture looked like prolonged obstructive bronchitis. The majority of patients had these signs, but exceptional cases may occur with only non-productive, continual cough for about 3-6 months. Complications and mortality were rare. With regards to clinical features, we conclude that there is a distinction between clinical manifestation of Pneumocystis carinii infection in children with severe congenital or acquired immune deficiency disorders and in normal children with temporary immuno-suppression because of underlying diseases.

IgG SUBCLASS DEFICIENCY IN CHILDREN WITH VIRAL RESPIRATORY DISEASES. G. Nasrullayeva, A. Enhova. Medical University, Baku, Republic of Azerbaijan.

Lasting and often repeated viral respiratory diseases are the main reasons that lead to an imbalance of immunological medication in children. These children usually have antibody deficiencies and suffer from high sensitivity to diseases. Specific antibodies such as immunoglobulin G against viral infections are the most important to measure. The purpose of this work was to investigate the humoral immune system in 116 children with acute viral respiratory diseases. The control group consisted of 36 children. The examination of serum IgG, IgA, IgM and IgGSc (subclass) showed that these children usually had normal levels of total IgG and IgM. It was established that in our patients with Influenza and Respiratory syncytial viral infection, IgGSc's expressed the most changes. These patients had high levels of IgG1 and IgG3, but antibodies of IgG4 subclass were found less often. In 30% of patients, IgG4 deficiency was associated with low levels of IgA, and in this group, respiratory complications were more likely. Thus, acute viral respiratory diseases in children frequently occur with deficiencies in any of the IgGSc.

BRONCHITIS DEFORMANS - TO DO SURGERY OR NOT? K. Ceglecka-Tomaszewska, J. Ziolkowski, A. Koczynski, A. Wyhowski, J. Wieteska, M. Kulus. Warsaw Medical School Hospital for Children, Dzialdowska 1, Warsaw, Poland.

Bronchitis deformans is the result of chronic inflammation most often occurring in the bronchi of the lower or middle right lobe. According to our observations such changes are usually caused by pneumonia. During the 1990-1995 period, we observed 7 children with bronchitis deformans that underwent surgery. Three had pneumonia in the first year of life, not very severe in the course, and as it was thought, without any permanent changes in the respiratory system. The next pneumonia and later persisting auscultatory changes were the reasons of hospitalization, usually several years after the first episode of pneumonia. On bronchography we found the characteristic picture for bronchitis deformans in the region of the last pneumonia. One boy had respiratory symptoms for more than 10 years (recurrent bronchitis and pneumonia). Bronchography performed at the age of eleven showed bronchitis deformans in the left lower lobe. The last three children had deforming changes of the bronchi, and two of them with even limited cylindrical bronchectasis, which were the result of pneumonias in the last several months. There was surprising divergence between clinical status, scant radiological and auscultatory symptoms, and the results of histopathology. The morphologic changes observed during surgery and confirmed later on pathology were evidence of a chronic, destructive process. However, the initial clinical and radiological evaluations were different. This confirms the proper decision of surgery by the thoracosurgeon. Our observations prove that opinion suggesting reversibility of bronchitis deformans type changes is groundless.

COURSE OF PULMONARY DYSFUNCTION IN CHILDREN AFTER PNEUMOCYSTIS CARINII PNEUMONITIS. I. Pavlenishvili, T.S. Parulava. Medical Academy, Tbilisi, Georgia.

Pulmonary function studies were observed in 17 patients 7 to 15 years of age, who survived the acute stage of pneumocystis carinii pneumonia. Spirometric indices, expiratory flows, arterial blood gases were studied at 1, 3, 6 months from the onset of disease. In all cases pulmonary dysfunction was significant when tested initially: decreased static lung volumes, impairment of pulmonary gas transfer factor, acid base and blood gas abnormalities. All patients had increased respiratory frequency. Total lung and vital lung capacities were decreased, residual capacity was 30% of total lung capacity. Specific diffusing capacity was also decreased by more than 72% from the normal mean. 15 of the 17 patients had a low forced expiratory volume in one second. Forced expiratory flows during middle half of the forced vital capacity (V_{pik}, V_{25}, V_{50}) were below the normal means, and time "lung-ear" was increased. A decrease in pulmonary gas factor was the most common abnormality, which was apparent in 14 studies. Five children had evidence of obstructive disease. Follow-up studies showed significant improvement of pulmonary function deficits within 1-3 months and complete resolution by 6 months in all patients. Our investigation indicates the importance of ventilation-perfusion abnormalities in children after pneumocystis pneumonitis. We conclude that pneumocystis carinii pneumonia cause short-lasting pulmonary sequelae. Pulmonary function in survivors returns to normal within six months after acute stage of infection.

CLINICAL PREDICTORS OF PNEUMONIA AND REQUISITION OF CHEST RADIOGRAPHS IN AMBULATORY FEBRILE CHILDREN. C. Sinaniotis, A. Fretzayas, P. Koukoutsakis, M. Moustaki, J. Kaleyas, C.H. Stavrinadis. 2nd Dept. of Pediatrics, University of Athens, "A. & P. Kyriakou" Children's Hospital, Athens 115 27, Greece.

Chest radiographs (CSR) have become one of the most common radiological procedures in all outpatient settings. Pediatricians continue to request a CXR in ambulatory children with fever and/or respiratory signs and symptoms because of the possibility that a clinically unexpected lung consolidation may occur. However, limited attention has been directed towards developing specific clinical criteria for ordering a CXR and it is often obtained in a nonsystematic and excessive manner. The present study examined the relationship between respiratory signs and symptoms and the likelihood of having a CXR diagnosis of community-acquired pneumonia in a population of febrile ambulatory children. All children aged 3 months to 14 years who were evaluated by pediatric residents in our Emergency Department during a two-month period (01.09.95 to 31.10.95) with fever (≥ 38°C) and/or respiratory signs (rhonchi, grunting, decreased breath sounds) and symptoms (cough, rhinorrhea) were eligible. Patients with major chronic diseases such as immunosuppression, cystic fibrosis, congenital heart disease, sickle cell anemia and asthma were excluded from the study. CXRs were assessed by an attending pediatric radiologist in a blind manner. During the study period, 3278 children were evaluated for a variety of clinical conditions. A total of 724 patients (250 were ≤ 2 years old), fulfilled the criteria and comprised the study population. Two groups were categorized according to whether or not respiratory signs and symptoms were present. Group I consisted of 299 patients and group II of 425 children. CRX was obtained in 133 children (71 of group I, 24% and 62 of group II, 15%). Based on the results, the diagnosis of pneumonia was assigned to 33% of children of group I and 17% of children of group II (p= NS). Positive CXR was found in 62.5% of children with respiratory signs and symptoms and in 19% of those with respiratory symptoms but without auscultatory findings ($p < 0.001$). Pneumonia occurred in 7.5% of children younger than 2 years of age and in 34.5% of older patients (p= 0.003). In summary, our study indicates that: a) the prevalence of pneumonia is relatively low in febrile children without respiratory signs especially in those less than 2 years old although routine CXR is usually obtained in these patients, b) the likelihood of having a CXR diagnostic for pneumonia is higher in those febrile children with respiratory symptoms and auscultatory findings.

THE EXPLORATION OF BRONCHIECTASIS. A REPORT OF 17 CASES. M. Jorio Benkhraba, A. Karim, C. Mahraoui, C.A. El Madani, A. El Malki-Tazi. Hôpital des Enfants, Rabat, Maroc.

Our study deals with 17 cases of DDB selected between 1992 and 1994 in the Service of infectious diseases of the Children's Hospital of Rabat (PI). This work focuses on the radiological and scintigraphic aspect of this pathology. A comparison between the following different exams: pulmonary radiography, pulmonary scintigraphy, bronchography and scanography with review of the literature allowed to evaluate the reliability of each of these methods of exploration. This study underlines the great reliability of TDM especially of high resolution and its place of choice in the diagnosis of bronchiectasis. But pulmonary scintigraphy, a sensitive exam and easily feasible with little irradiation, constitutes with standard radiography the first step in the diagnostic approach of this disease.

NOSOCOMIAL BACTERIAL PNEUMONIA AND TRACHEITIS IN A PEDIATRIC INTENSIVE CARE UNIT: A PROSPECTIVE STUDY ON INCIDENCE RISK AND RELATED COMPLICATIONS. M. Fayon, M. Tucci, J. Lacroix, L. Lafleur, C.A. Farrell, M. Gauthier, D. Nadeau. Service de Réanimation Pédiatrique, Hôpital Pellegrin-Enfants, Place Amélie Raba Léon, 33076 Bordeaux; and Montréal, Canada,

We conducted a prospective descriptive study in the multidisciplinary pediatric intensive care unit (pediatric ICU) of a tertiary-care university hospital in order to determine the incidence, risk markers, risk factors and complications related to bacterial nosocomial pneumonia (BNP) or tracheitis (BNT) in children. A cohort of 1114 consecutive admissions to the pediatric ICU was enrolled over a 56-week period; 154 cases were excluded mostly (75%) because they already had a respiratory infection at entry. The final sample included 960 admissions (831 patients). Diagnosis of BNP or BNT was based on Centers for Disease Control of Atlanta criteria using a consensus method involving 3 experts. These experts also attributed complications to BNP and BNT. A total of 29 (3.0%) BNP and BNT were diagnosed (1.2% BNP; 1.8% BNT). Three factors were retained by multivariate analysis as independent risk factors/markers for BNP and BNT: male sex, respiratory failure, and neuromuscular blockade. Gram-negative bacteria and Staphylococcus aureus were the microorganisms most frequently involved. Prescription of antibiotics was commonly attributable to BNP (75%) and BNT (59%). Death, as well as MOSF resulted from BNP in 8% of cases, but never from BNT. In BNT, the reintubation rate was 24%. Nosocomial bacterial respiratory infections are rare in critically ill children. As much attention should be accorded to BNT as to BNP in these patients.

IMMUNOSEROLOGICAL TEST TO REVEAL STAPHYLOCOCCAL PNEUMONIA IN CHILDREN OF EARLY AGE. T. Nurmukhamedov, A. Alimukhamedov, A. Kasymov, R. Hidoyatov. Republic of Uzbekistan, C Tashkent 206, Massiv Yunus-Abad.

Toxic and septic diseases still have a great importance. We developed an antibody erythrocyte test based on hen erythrocytes sensitized with monospecific goat antibodies against more antigen-active staphylotoxin components. We examined 208 children with toxicoseptic pathology; 105 of them were premature newborns and 103 infants. Staphylococcal invasion was

confirmed bacteriologically in 31 cases (22.9%) in the group of premature newborns and in 18 cases (17.5%). While performing an immunoserological test, an etiological factor was revealed in 52.6% of premature newborns (71 cases) and a positive response was found in 82.5% of infants (85 cases). Thus, the developed immunoserological reagent provides the possibility to determine the etiological factor at early stages of pathological states.

CHLAMYDIA PNEUMONIAE INFECTIONS IN CHILDREN UNDER FIVE YEARS OF AGE. F. Raymond*, S. Troller*, G. Giraudeau**, G. Agius**. *Dept. Pediatrics; **Dept. Microbiology, University Hospital, Poitiers, France

Seroepidemiologic studies with the microimmunofluorescent test have shown a rapid increase in Chlamydia pneumoniae (CP) antibody prevalence from 5 to 15 years old. CP does not appear to be an important upper or lower respiratory pathogenic germ in young children. A one year prospective study was carried out to establish the incidence, characteristics and evolution of infections by CP. Among children under 5 years of age admitted to our institution for respiratory infections, we performed serology and direct fluorescent monoclonal antibody (DFA) for CP, serology and culture for viruses. Children, age- and sex-matched, without respiratory infections were also investigated to estimate the carriage of CP in the throat. We found 34 DFA-positive children. Serologic tests were initially negative. Mean age was 25.2 months. All the children had a cough and 42% had fever. The time interval from the onset of symptoms to hospital visit was 7.15 days. Sixty percent of the children were previously treated by antibiotics (95% betalactamines). Upper respiratory illnesses were seen in 70% of cases. Lower respiratory tract involvement occurred in 88% of cases. Bronchitis was diagnosed as often as pneumonia (35,5%). Chest X-rays showed bilateral infiltrates in 57% of cases. We also found instances of asthma and bronchiolitis. The mean number of white blood cells was 13729+/-5937/mm3. Coinfections with viruses were found in 30% of the cases. This might influence the clinical presentation of these children. Eighty-two percent of the children required hospitalization for more than one day. Among them 88% had antibiotic treatment (60% Macrolides) for about 10 days. Many children demonstrated clinical improvement with or without antibiotic treatment. The course of the illness was prolonged with persistent cough during one month or more in 20% of cases. Two children were still DFA-positive after two months. No prognosis factor has been found for the prolonged clinical course. In our study, the incidence of CP-DFA positive in children under 5 years with signs of respiratory tract infections was 12% viruses remaining the most common etiological agent (22%). No CP was isolated from the controls. The incidence of CP as a cause of community-acquired pneumonia is evaluated as 12% in adults and 4% in children, which is what we found in our study.

COMMUNITY-ACQUIRED PNEUMONIA IN CHILDREN: UNDERESTIMATION OF MYCOPLASMA PNEUMONIAE INFECTION AND EFFICACY OF ANTIBIOTICS. D. Gendrel*, F. Moulin, J. Raymond, J.L. Iniguez, S. Ravilly, G. Kalifa, P. Lebon. St Vincent de Paul Hospital, Paris, France.

Antibiotic therapy remains presumptive in child CAP when pathogens are not identified. During 30 months, a complete investigation was performed in 104 children from community, aged 18 months to 15 years with fever, respiratory symptoms and radiographically confirmed CAP. Blood culture, samples for viral culture and acute/convalescent sera for serology of respiratory viruses, *Mycoplasma pneumoniae* (MP) and *Chlamydiae pneumoniae* (CP) were collected. Among the 104 children included, a potential causative agent was identified in 89 (85%) cases. A viral infection was assessed in 30 patients (RSV 10, parainfluenza 6), CP in 1 and staphylococcal infection in 1. *Streptococcus pneumoniae* (SP) was identified in 12 patients (8 blood culture, 4 soluble antigens). Unilobar infiltrate typical of SP was found only in 6/12. All SP strains were sensitive to penicillin and apyrexia was obtained in 48 hours or less with amoxicillin in 11/12 cases. 2 other children had a SP + MP coinfection. The 41 remaining children (40%) had seric IgM and a rise in IgG in paired sera specific for MP. Chest X-ray showed unilobar pneumonia in 29/41 (5 with lobar consolidation mimicking SP), and biological data were not able to separate MP and SP infections. Failure of treatment was observed in the 28 MP infected patients receiving initially βlactams. In 18 patients with proven MP infection, the initial diagnosis was "Peni-Resistant pneumococcus pneumonia". Using macrolides (spiramycin 31, josamycin 7, erythromycin 3), fever fell in 3 days or less in all cases, but cough persisted during 1 month in 12 patients. MP infection in CAP of children over 18 months is widely underestimated and must be considered when lactams are not rapidly efficient.

BRONCHIECTASIS IN INFANCY. P. Murtagh, N. Nunez Franco, H. Gonzalez Pena, M. Grenoville, E. Diez. Hospital Dr. Juan P. Garrahan, Buenos Aires, Argentina.

The prevalence of bronchiectasis (BC) has decreased in developed nations but our country is a frequent cause of chronic lung disease. We report 268 cases admitted to our hospital from 1987 to 1995. BC were classified in 4 groups. Group I: Postinfectious (n=165), Acute lower respiratory (n=147), Measles (n=9), Pertussis (n=3), Tuberculosis (n=6). Group II: Aspiration and inhalation injuries (n=12), Chronic Aspiration Syndrome (n=11), Foreign body (n=1). Group III: Genetic and Congenital Disorders (n=87), Cystic Fibrosis (n=39), Immunodeficiencies (n=34), Kartagener (n=4), Mounier-Khun (n=1), Marfan (n=1), Lung malformations (n=8). Group IV: Miscellaneous (n=4), Sarcoidosis (n=1), Actinic Pneumonitis (n=1), Mucopolysacharidoses (n=1), Bronchial Adenoma (n=1). We analyzed BC secondary to non-specific acute lower respiratory infections (n=147). Adenoviral pneumonia was the etiology in 20% of these cases. In 80% of the cases the age of onset was under 2 years old. Clinical symptoms were similar to those described in the literature. Bronchial hyperreactivity was observed in 61% of cases, 43% had signs of chronic lung disease, 21% had failure to thrive and 9% hemoptysis. The most frequent radiological findings were interstitial peribronchial vascular thickening (IPVT) (66%), atelectasis (41%) and alveolar consolidation (35%). In HRCT the observed alterations were cylindrical, varicose and cystic BC (100%), IPVT and increased network (43%), atelectasis (47%) and mosaic perfusion (20%). Conclusions: 1) High incidence of post acute respiratory infection BC. Adenovirus was the most frequently diagnosed etiological agent. 2) Early age of onset of the disease. 3) HRCT allowed an excellent assessment of the localization and type of BC and associated parenchymal abnormalities.

MEASLES: UNUSUAL PULMONARY COMPLICATIONS WITH REGARD TO A PREVIOUS CASE. G.A. Maidana, L. Moro, S.P. Pedemonte, J.C. Perez Colmegna, A.N. Turganti, C. Levin. Hospital Bernardino Rivadavia y Hospital Maria Ferrer, Buenos Aires, Argentina.

Objective: To show an unusual complication of measles pneumonitis and emphasize the importance of systematic vaccination concerning the disease. Report: The patient is a Paraguayan 7 year-old girl with 2nd degree malnutrition having received no vaccine and with no respiratory disease background up to such age when she started suffering from measles. Within 10 days from the start of the disease, torpid evolution SDR with hypoxia and hypercapnia occurred and is confined in hospital for treatment and diagnosis. Further confinement in hospital is required with ARM being shown on two of such occasions. Due to poor evolution she is sent to our country for confinement at our hospital. Upon her entering our hospital, SDR, PO_2 38, PCO_2 38.8, pH 7.44, EB + 1 occurrence is found, these being the stigma for chronic pulmonary disease, left-hand brachiocrural paresis and 3rd degree malnutrition. Due to the severity of her pulmonary disease requiring increasing oxygen concentrations and because of X-ray alterations (multiple pneumatocele) as well as disease progression, she is sent to the transplantation plan but dies in confinement 8 months later after overaggregated Adenovirus pneumonitis. Conclusions: This patient is presented in order to show the unusual sequel to measles pneumonitis (as confirmed by serology) on one hand and on the other hand to emphasize the importance of vaccination in preventing this disease which would have impeded a girl's death at a very low cost.

TREATMENT OF BACTERIAL PNEUMONIA BY CEFIXIME IN CHILDREN: EFFICACY AND TOLERANCE. M De La Luz, Clinica Las Vegas, Medellin Colombia.

Objectives: To evaluate clinical efficiency and tolerance to cefixime in children aged two months to twelve years affected by bacterial pneumonia. Methods: Illness was diagnosed by means of clinical and paraclinical criteria, including cultures, pointing to bacterial etiology. A once-daily dose of 8 mg/kg of cefixime was given orally for 14 days. Clinical examination and laboratory tests were carried out at days one, five and fourteen of treatment. Adverse reactions were assessed in liver, kidneys, blood and gastrointestinal tract. Results: Forty children were treated, of which 55% were male and 45% female, 62.5% of patients were aged two months to two years. Fever was present in 95% of cases and was higher than 38.5% in 62.5%. Temperature

was normal in all cases at the end of the treatment. Pneumonia was present in 52.5% of children, bronchopneumonia in 30% and interstitial pneumonitis in 12.5%. In 30 cases (80%) a complete resolution of radiological findings was found at the end of the treatment. Clinical cure was evident in 39 patients; the remaining one deteriorated over the first five days of therapy and was withdrawn from the study. In this case an etiologic agent was not detected. C-reactive protein, which was initially elevated in every patient, was normal by day 14. Two cases of mild gastrointestinal intolerance manifesting as diarrhea were observed, although increased serum glutamic oxaloacetic transaminases were present in eight patients, three of which also had increased serum glutamic piruvic transaminases and one showed increased alkaline phosphatases. An additional case showed a mild increase in serum creatinine. In total, nine cases (22.5%) showed signs of side effects at their laboratory tests. Conclusion: Although clinical and X-ray findings were optimal in thirty-seven cases (92.5%), the finding of 22.5% of cases with adverse effects on the basis of biochemical tests justifies further studies, in particular such reactions that are found in children aged less than two years.

COMMUNITY TRIALS ON CASE MANAGEMENT OF ACUTE RESPIRATORY INFECTIONS IN RURAL VILLAGES. C.B. Kartasasmita, H. Mintardaningsi, O. Rosmayudi, A.U.Suardi, H. Sukandar, and Respiratory Diseases Working Group. Medical Faculty, Padjadjaran University, Bandung, Indonesia.

Community trials were conducted in two rural subdistricts in Subang, West Java, Indonesia. Cisalak was selected as intervention area and Sagalaherang as reference area. Each subdistrict has 13 villages. The intervention concerns the new version of case management on ARI introduced by WHO. All babies born in those 2 areas between January and December 1994 were enrolled in the study, and followed for 6 to 12 months. The babies were visited every 2 weeks by field workers. They examined the babies and interviewed mothers about ARI signs and symptoms by using a pretested questionnaire. During that period, 960 babies were born, 53.3% in Cisalak and 46.7% in Sagalaherang. During 18 months of study 548 babies were followed for 12 full months; however only 263 had complete data. The morbidity of ARI increased with increasing age; however, there was no difference between the two study areas. The prevalence of ARI at the age of less than 3 months was 35.1% and 32.7%; between 4 and 6 months, 49.9% and 45.3%; between 7 and 9 months, 47.0% and 45.9%, and between 10 to 12 months, 53.7% and 50%, for Cisalak and Sagalaherang, respectively. Nevertheless, the mortality in Sagalaherang was higher than in Cisalak (118 per 1000 and 78 per 1000, respectively), and the ARI-related deaths were 66% and 52.5%, respectively. The conclusion is that mothers and primary health care workers in the rural areas should be taught and encouraged to use case management of ARI, and monitoring and evaluation of the application is needed.

PREDICTIVE VALUE OF SIGNS AND SYMPTOMS IN THE RADIOLOGIC DIAGNOSIS OF ACUTE SINUSITIS. C. Cyr, R. Racette, C.P. Leduc, C. Blais. Centre Hospitalier Universitaire de l'Estrie, Sherbrooke, Canada. J1H 5N4.

Introduction: Upper respiratory tract infection is a common clinical problem in primary care. Wald et al. (1991) reported that acute sinusitis complicated 5-10% of upper respiratory tract infections. Objective: Evaluate the predictive value of signs and symptoms in the diagnostic work-up of patients with clinically suspected acute sinusitis. Methods: 392 consecutive children aged less than 18 years, with clinically suspected acute sinusitis were studied. A standardized data collection form was mandatory for all orders of sinus radiographs. Test ordering and patients charts were computerized. Radiologic characteristics and diagnostic interpretations were provided by two radiologists, blind to the clinical data. Total opacification, fluid level or mucosal thickening ≥ 4 mm were used as hallmarks of sinusitis. Results: 273 patients had a radiologic diagnosis of acute sinusitis. Positive predictive values (PPV) for the main signs and symptoms are:

	n	PPV (%)
Interorbital fullness	78	75.0
Rhinorrhea	196	74.8
Wet cough worst at night	70	68.0
Fever	146	67.9
Unilateral rhinorrhea	23	63.9
Purulent rhinorrhea	83	63.4

Conclusions: This study confirms the uncertainty of the clinical diagnosis of acute sinusitis in primary care. The situation is present despite the high prevalence of radiologically confirmed acute sinusitis in our setting.

COMPARATIVE STUDY ON TUBERCULIN TYPES RT23, IP48 AND 5180A IN BCG VACCINATED CHILDREN. P. Spyridis, E. Pateraki, D. Sophianos, D. Kalamara, N. Myriokefalitakis, M.A. Magiakou, C. Sinaniotis. 2nd Dept. of Pediatrics, University of Athens, Aglaia Kyriakou Children's Hospital, 11527 Athens, Greece.

The aim of the study was to evaluate the reliability of Merieux's Tuberculin Lot 5180A as compared to that of RT23 (Copenhagen) and IP48 (Pasteur) when used in BCG-vaccinated children. For this reason, we performed a Tuberculin Skin Test in 3 groups of children aged more than 6 years (age range 6-12 years). Group A: Children vaccinated 3 months before being skin tested with either IP48 or 5180A. Group B: Children vaccinated 1 year before being skin tested with two Tuberculins simultaneously, so that the right forearm received one and the left forearm the other. Group C: Children vaccinated 1, 2, 3 or 4 years before being skin tested with Tuberculin 5180A. All results are depicted in the Table below.

	Tuberculin	Time after BCG	Positive/Total	(%)
	IP48	3 m	1044/1089	95.8
Group A	5180A	3 m	242/244	98.5
	IP48	1 y	241/319*	75.5*
	5180A	1 y	313/319	98.1
Group B	IP48	1 y	110/149	73.8
* $p < 0.001$	RT23	1 y	113/149	75.8
	RT23	1 y	46/70*	65.7*
	5180A	1 y	66/70	94.2
	5180A	1 y	533/539	95.5
	5180A	2 y	68/82	84.0
Group C	5180A	3 y	69/77	89.5
	5180A	4 y	60/71	84.5

In conclusion, we report the higher reliability of Merieux's Tuberculin Lot 5180A in demonstrating the already developed delayed hypersensitivity due to Pasteur's BCG, currently in use.

MANTOUX SKIN REACTION SIZE IN BCG VACCINATED CHILDREN. P. Spyridis, E. Pateraki, D. Sophianos, J. Mathioudakis, M.A. Magiakou, C. Sinaniotis. 2nd Dept. Of Pediatrics, University of Athens, Aglaia Kyriakou Children's Hospital, 11527 Athens, Greece.

The extent of BCG-evoked delayed hypersensitivity reaction, indirectly measured by Mantoux skin reaction size (SRS), varies among different population groups, and depends on the type of reagent used in both the vaccine and tuberculin, the mycobacterium strain, the natural environment, as well as on some technical details. Mantoux sizes of 4-13 mm, 4-19 mm and more recently, of 4-10 mm have been suggested by the American Academy of Pediatrics as physiological. We attempted to demonstrate that BCG vaccination invalidates skin reaction testing as a diagnostic tool for Tuberculosis. For this reason we determined the Mantoux SRS (using Merieux's Tuberculin Lot 5180A) in children older than 6 years of age, who had been vaccinated 1 and 2 years before the skin test. The children studied were inhabitants of urban (n= 457), and suburban (n= 299) areas. In the former areas, the Mantoux SRS fluctuated from 4 to 30 mm (14.17 ± 4.72, mean ± SD) in children tested 1 year after vaccination, and from 4 to 40 mm (14.28 ± 5.53) in children tested 2 years after vaccination. In the suburban areas, Mantoux SRS was 4-22 mm (6.69 ± 3.45) and 4-20 mm (6.99 ± 3.45), respectively. The difference in Mantoux SRS between children of urban and suburban areas was statistically significant at both 1 and 2 years after vaccination ($p < 0.001$). No significant discrepancies were noted in BCG scar size, with an average of 4 mm in the urban and 5 mm in the suburban areas. In conclusion, we suggest that, indeed, BCG invalidates the Mantoux SRS as a diagnostic tool for Tuberculosis. The discrepancy observed in Mantoux SRS between two largely similar population groups, vaccinated with the same reagent, and tested by the same tuberculin preparation at the same period of time, might be attributed to technical differences in performing the skin test by the trained staff.

PULMONARY TUBERCULOSIS IN VACCINATED AND NON VACCINATED INFANTS. A. Abid, A. Benjelloun, A. Zineddine, J. Najib, F. Dehbi. Service de pédiatrie 4, Hôpital d'Enfants, Casablanca, Maroc.

In spite of huge struggles against tuberculosis, this infection remains a major public health problem in Morocco as the child is affected at a rate of 21%. The strategy is based on compulsory BCG vaccination at birth (National Program of Immunization since 1982) and treatment of diagnosed tuberculosis. We made a retrospective analysis of 208 cases of pulmonary tuberculosis in the infant, collected from 1980 to 1995. Most patients considered were vaccinated with BCG (84%). On the epidemiological level: a high frequency in infants of 2 to 6 months, a weight / age < 80% in half of the cases (NCHS norms), a tuberculous contagion known in 84% of the cases where the small family represents 60%. The polymorphism of the initial clinic board, where signs of respiration lack in 22% of the cases, was the cause of the diagnostic delay (74% consulted after 1 month of evolution). The disseminate respiratory forms were met in 74% of cases. Extra-respiratory localizations had been noticed in 27% of cases where neuro-meningeal reach occupied first place. Mortality represented 12% of the cases, especially in the disseminated forms. In spite of the vaccination by BCG, the severe forms of tuberculosis are not rare in infant. These results could be explained not only by absence of the effectiveness of neonatal BCG vaccination but mainly by the importance of tuberculous contagion and the poor nutritional state of these children. The evolutive and disseminated forms are also in correlation with the delay of the diagnosis. Hence the management of this infection should stress the point on the nutritional state. The prophylaxis rests especially on better sanitary education, finding and precocious treatment of the bacillifer tuberculous.

BRONCHOSCOPY IN PULMONARY TUBERCULOSIS IN CHILDREN. Zorica Zivkovic, S. Petrovic. Children's Hospital for Pulmonary Diseases and Tuberculosis, Beograd, Yugoslavia.

Pulmonary tuberculosis in children has been accompanied by intrathoracal lymph node affection. This condition has been a main cause for various endobronchial lesions, detectable only by bronchoscopy. Uncomplicated forms of pulmonary tuberculosis in children have a normal bronchoscopic picture or very moderate degrees of extramural compression. Complicated forms of pulmonary tuberculosis have serious bronchoscopic findings such as endoluminal granulation, perforation with caseos masses, fistulae and sclerotic lesions. Very delicate therapeutic procedures during bronchoscopy have been used for evacuation of caseum, purulent secretion, granulation tissue and for dilatation of stenostic parts. 45 patients were analyzed, aged one to 15 years, and bronchoscopically evaluated with previously established diagnosis of complicated lung tuberculosis. The results were: signs of extramural compression (EMC) in 36%, lymphoglandular perforation with EMC in 30%, granulation tissue with EMC in 24% of cases, stenostic lesions of right main or intermediary bronchi in 8%, the remaining 2% were chronic mucosal inflammations. After this procedure and appropriate antituberculosis treatment, the rate of sequels was diminished. By this method we are able to treat pulmonary tuberculosis in children without sequels.

EARLY ONSET PULMONARY TUBERCULOSIS IN TWO INFANTS. N. Salman, A. Somer, I. Yalçin, N. Güler, U. Önes. Istanbul Medical Faculty, Department of Pediatrics, Infectious Diseases, Clinical Immunology and Allergy.

In developing countries including Turkey, the incidence of tuberculosis has increased. Despite the recent resurgence of tuberculosis among children, there are only few studies reporting tuberculosis in infants less than one year of age. In this study, we report pulmonary tuberculosis in two infants less than 3 months of age. Case 1: A 2-month-old girl was hospitalized because of fever, cough, cyanosis and respiratory distress. Chest roentgenogram and CT scan of the lung revealed consolidation of right lower lobe and pleural effusion in the posterior pleural space of the right lung. Although Mantoux tuberculin skin test performed on admission was negative, 10 days later, the induration was 8 mm. Gastric aspirate cultures yielded *M. tuberculosis*. Case 2: A 3-month-old boy was hospitalized for fever, cough, sweat and dyspnea lasting for a month. The mother was receiving antituberculosis. The tuberculin skin test of the infant was 13 mm induration. Chest roentgenogram and Ct scan of the lung revealed left hilar and mediastinal lymphadenopathies, right upper lobe infiltration, hyperaeration of the entire left lung and herniation to the right. Resolution of symptoms and radiographic improvement was observed. Pediatricians should be aware of the clinical presentation and radiographic findings of pulmonary tuberculosis in young infants to aid in early diagnosis.

TUBERCULOUS PLEURISY IN CHILDREN (ABOUT 294 CASES). J. Najib, A. Zineddine, S. Chafai, A. Abid. Service de pédiatrie 4, Hôpital d'Enfants, Casablanca, Maroc.

The retrospective study of 294 cases of tuberculosis pleurisy in children, collected in the infectious disease unit, shows that this pathology remains relatively frequent (32%). This is largely justified by a net recruitment in the unit rather than by a true rise in this pathology. The high number of children believed to be BCG vaccinated (87%) may be interpreted not only by the lack of control of the quality of the BCG vaccine and the vaccination itself, but also, and largely, by the importance of tuberculous contagion (69%) and by the deplorable nutritional state of the children. Polymorphism of the initial clinical board, where respiratory signs are lacking in 15.6% of cases, remains the cause of diagnostic delay (41% have consulted after a month's evolution). In most cases, the radiographic aspect consists of a free pleurisy in the great cavity, the abundance of which is at least ranged step II (55%). The pleural biopsy has much contributed to the diagnosis (59%). On the therapeutic level, the association isoniazid-streptomycin has been mostly used. Present orientation is toward short treatments with rifampicin-izoniazid-pyrazinamid. Corticotherapy, of systematic prescription outside contra-indications, is recommended by many authors. Kinesitherapy must be scientific. We will finally insist upon mass sanitary training which makes up a fundamental part of the whole program of the anti-tuberculosis campaign.

PNEUMOTHORAX COMPLICATING ACUTE MILIARY TUBERCULOSIS IN CHILDREN. A. Abid, A. Zineddine, F. Lasry. Service de pédiatrie 4, Hôpital d'Enfants, Casablanca, Maroc.

Pneumothorax is a well known complication of cavitary tuberculosis. However, it is extremely rare in acute miliary tuberculosis and only a few cases have been reported in the world. Pneumomediastinum and sub-cutaneous emphysema are other uncommon complications of this disease. Five children cases of acute miliary tuberculosis are described. Four cases (13 months, 18 months, 8 years and 14 years) were complicated by pneumothorax without pneumomediastinum and one case (2 years) by sub-cutaneous emphysema without pneumomediastinum. In 1 case pneumothorax occured on the left side, 2 cases on the right side while 1 was bilateral. None of the patients died. After needle aspiration (3 cases) and thoracic drainage (1 case), the lung expanded completely (3 cases) or partly (1 case) in about 1 to 3 weeks. The mechanism in acute miliary tuberculosis is not clear however and include several possibilities: one mechanism may be an initial pneumomediastinum with leakage of air through the mediastinal pleura causing bilateral pneumothorax (1 case). Another possible mechanism may be caseation or necrosis of subpleural miliary nodules and their subsequent rupture through the pleura (1 case). Either one or both of these mechanisms may be operative in acute miliary tuberculosis complicated by pneumothorax (2 cases).

BRONCHOSCOPIC DIAGNOSIS IN TRACHEOBRONCHIAL COMPRESSION IN PRIMARY PULMONARY TUBERCULOSIS. G. Susana Traversaro, Doris Primrose, Ana Balanzat. Hospital de Clinicas "Jde San Martin". Buenos Aires, Argentina.

Primary pulmonary TB (PPTB) can present different clinical signs such as pertussis-like cough, chronic and persistent cough, atelectasis, middle lobe synd., lobar emphysema and/or bronchiectasis. The characteristic chest radiography (Rx) manifestation is hiliar and/or mediastinal lymphadenopathy. A preliminary study is presented in order to establish a correlation between the clinical and/or radiographic signs and endoscopic findings in children with PPTB. The study group was composed of children between the ages of 3 months and 12 years with suspected PPTB according to WHO diagnostic criteria. Children with tuberculous pneumonia, miliar, evident hiliar and/or mediastinal lymphadenopathy, 0_2 Sat. < 89%, coagulation alterations, previous treatments with tuberculostatic drugs and/or glucocorticoids in the last 2 months or children with asthma were excluded. Bronchoscopy was performed at the Hospital Clinicas J. de San Martin using rigid bronchoscopy. Parents were asked to give written consent, after detailed explanation of procedures; diagnostic utility and risks were given. The work design was observational, prospective and transversal using Dbase III and multivariable statistical analysis. Until now five children have been studied establishing nominal scale clinical variables: productive cough, bitonal and pertussis-like

cough, rhonchus, wheezing, crackles, Rx images and endoscopic findings determined by tracheobronchial endoscopic compression criteria: distortion and carinal enlargement, bronchial distortion, diminished diameter by more than 30% due to external compression. Four of the patients who were asymptomatic without Rx signs of hiliar and/or mediastinal lymphadenopathy evidenced signs of tracheobronchial compression and reduction of bronchial diameter of more than 30%, thus changing our therapeutical conduct. We can establish an approximation in correlating bronchoscopic findings and the diagnosis of asymptomatic PPTB without clinical or Rx signs, on the basis of this preliminary study in 5 patients. We believe that a greater number of patients will allow us to evidence if bronchoscopy is required in this group of patients in order to establish if chemoprophylaxis or treatment is needed.

DIAGNOSING ASTHMA WITH THE USE OF CAPNOGRAPHY. Janusz Haluszka, Grzegorz Willim. TBC and Lung Diseases National Research Institute, Pediatric Division in Rabka, Poland.

It is expected that subjects suffering from asthma, irrespective of their age, would express higher variability of bronchial patency than healthy subjects. In cooperating subjects, e.g. school-age children, continuously repeated measurement of the peak expiratory flow rate (PEFR) at home is the most reliable means of diagnosing and controlling variability in the size of airways. Other more complicated laboratory methods of measurement, e.g. airway resistance for gas flow with the whole body plethysmography or maximal expiratory flow-volume loop, also need full cooperation of the examined patient. The above mentioned methods therefore cannot be applied in non-cooperative subjects such as pre-school children. In our opinion, the analysis of variability of "$C0_2$ concentration to time curve" during spontaneous breathing is the most highly recommended diagnostic tool, because such a measurement does not require cooperation of the subject nor does it disturb respiration in the least. Therefore, it is easily applicable in small children at any clinical stage, even unconscious. The reasons for automated analysis of capnographic measurements in children will be given in our presentation in comparison with other commonly applied methods which do not require any respiratory maneuver from the patient: forced oscillation technique and single step measurement of specific airway resistance.

LUNG FUNCTION AND EXERCISE TESTING IN CHILDREN WITH BRONCHIAL ASTHMA. A.S. Glybin, B.M. Stolper, E.V. Jakon, G.A. Sofiich, S.N. Lyzhenkova. Research Institute of Pediatrics & Children's Surgery, Ministry of Public Health, Moscow, Russia

This work deals with the study of physiological and pathological questions of exercise testing (ET) under maximal and submaximal workload of gradually increasing intensity ($PWC_{150-170}$). 63 children, 4-14 years, with non-severe forms of bronchial asthma (BA) were evaluated. Dynamic spirography, determination of oxygen consumption and carbon dioxide production, blood pressure and EGG monitoring during ET with 24 circulatory and respiratory mathematical criteria for assessing the organism's response to exactly dosed physical workload were applied. Pharmacological tests with bronchodilatators (salbutamol or berotec) after ET were used. Most parameters of lung function testing with various degrees of changes (mild or significant) in all children with BA were observed. Both circulatory and respiratory changes during ET were revealed in children with BA, faster than in controls: especially evident was the increase of ventilation and decrease in oxygen consumption, 3 minutes before the drop of diastolic pressure. This data corresponds to disorders of repolarization processes in myocardium in children with BA, which occurred frequently. Bronchoconstriction after ET developed in one third of the cases. Circulation, ventilation and gas metabolism parameters revealed disadaptability in circulatory and respiratory systems and low tolerance before reaching maximal workload in children with BA.

PEAK EXPIRATORY FLOW RATES IN HEALTHY TURKISH CHILDREN LIVING IN ISTANBUL. Ü. Öne *, A. Somer*, N. Sapan*, R Di çi**, N. Güler*, N. Salman*, I. Yalçin*. * Istanbul Medical Faculty, Department of Pediatric Infectious Diseases, Clinical Immunology and Allergy. **Istanbul Medical Faculty, Department of Public Health and Statistics, Istanbul, Turkey.

In the evaluation and management of bronchial asthma, simple instruments for measurement of peak expiratory flow rate (PEFR) are needed. There are two main reasons for a population study of a variable such as PEFR. The first is to establish a reference range for clinical use and the second is to examine population differences or the physiological development of the variable. Normal values for Turkish children have not been published. In a cross sectional study, we measured PEFR in 2791 healthy school children (1468 boys and 1323 girls) aged 7-14 years, living in 6 different regions of Istanbul, the largest and cosmopolitan city of Turkey. We used the Mini Wright peak flow meter which is a practical and common way of measuring PEFR. All tests were performed in the standing position with a nose clip with the best of three trials recorded. We found that height, age and sex had a significant effect on the regression equation. The equation for prediction of PEFR in boys was calculated as (3.5 x height) + (9.2 x age) - 256.5 ($p<0.0001$, $r=0.83$), and for girls (3.3 x height) + (10.2 x age) - 263.7 ($p<0.0001$, $r=0.81$). These findings will serve as an important basis for preparing charts for normal PEFR values for Turkish children.

LEVEL OF BRONCHIAL HYPERREACTIVITY IN ASTHMATIC PRE-SCHOOL CHILDREN: CONTRIBUTION TO THE DIAGNOSIS OF ASTHMA. M.R. Benoist, P. Rufin, S. Waernessyckle, P. Scheinmann. Hôpital Necker-Enfants Malades, Paris, France.

It is debated whether wheezy pre-school children have the same level of Bronchial Hyperreactivity (BHR) as older asthmatic children and whether body size should be taken into account to interpret airway responsiveness. In an attempt to answer these questions, we compared bronchial response to methacholine challenge (MchC) in 2 groups of pre-school children : group I (n=51) aged 40±5 months consisted of a prospective study in infant bronchiolitis. MchC tests were performed every 6 months; at the fifth MchC, no or few wheezing episodes were observed during the 6 previous months, most of them were asymptomatic. Group II : (n=28) aged 38±6 months consisted of children referred to perform lung function tests for severe clinical symptoms of asthma in the last 6 months, with a mean of 3 episodes of severe chest tightness and wheezing requiring bronchodilators and emergency visits. MchC were performed in symptom-free period. A positive response was defined as a decrease in transcutaneous oxygen tension of at least 15 percent (PD15 PtcO2). The results of MchC were:

	PD15PtcO2	SD	MEDIAN
Group I	210	189	166
Group II	201	154	156

BHR was similar in group I and II. This study assessed BHR levels in asthmatic pre-school children (group II). Are infants with previous episodes of bronchiolitis potentially asthmatic ?

REPRODUCIBILITY OF THE NASAL PROVOCATION TESTS (NPT) TO DERMATOPHAGOIDES PTERONYSSINUS (DP) IN ASTHMATIC CHILDREN. R. Jean, E. Paty, P. Rufin. Laboratoire EFR, Service de Pneumologie et d'Allergologie Pédiatriques, Hôpital des Enfants Malades, Paris , France.

NPT is useful in assessing the diagnosis of allergy to DP in asthmatic children. The aim of this study was to determine if specific NPT might be sufficiently reproducible to evaluate the results of immunotherapy to DP. 30 children, mean age 9 years (4-15), suffering from asthma and perennial rhinitis, allergic to DP according to the usual criteria (suggestive history, positivity of prick-tests, RAST class 3 or 4), underwent specific NPT just before hyposensitization and once every year during the 2 or 3 years of immunotherapy to DP. During each challenge, immediate reaction (IR) was evaluated as positive (+) or negative (-) according to clinical scores. The late response (LR) was classed as +,-, or dubious (?), according to clinical scores from questionnaires. The result are shown in the table:

	Before Immunotherapy	> 1 year	> 2 years	> 3 - 4 years
N	30	28	23	20
IR	28+ 2-	27+ 1-	22+ 1-	19+ 1-
LR	23+ 6- 1?	10+ 14- 4?	9+ 13- 1?	8+ 9- 3?

IR was very reproducible: it was not changed by immunotherapy and seemed to be a bad criterion to assess the value of immunotherapy. On the contrary, reproducibility of LR could not be evaluated in this study owing to a possible effect of immunotherapy on the inflammatory process: after 2 weeks, 13/23

were negative against 6/30 before hyposensitization ($p<0.001$). It would be useful to study the reproducibility of the LR in children allergic to DP without immunotherapy.

PULMONARY FUNCTION TESTING IN YOUNG CHILDREN: EVALUATION OF THE INTERRUPTER TECHNIQUE (Rint). F.-P. Counil, F. Amsallem, S. Guillaumont, P. Ariole, R. Dumas, M. Voisin. Service de Pédiatrie, Unité fonctionnelle de cardio-pneumologie infantile, CHU Arnaud de Villeneuve, Montpellier, France.

The aim of this study was to evaluate the reliability of assessing airflow resistance by the interrupter technique (Rint) in children. 75 children (mean age 9.32 subjects between 3 and 7 yrs), were selected from the outpatient clinic of our pediatric department on the basis of a reproducible flow-volume curve performance. Two consecutive Rint (Rint1 and Rint2) were repeatedly measured during normal expiration, 7 to 15 measurements were recorded for each patient. The intra subject coefficient of variation (CV) was 15% ± 7 for Rint1 and 22% ± 1 for Rint2. Multiple stepwise regression did not show any correlation between CV and age ($r=0.14$) or pulmonary function parameters. Rint1 was highly correlated with the Tiffeneau's rate ($r=0.48$, $p<0.01$), forced expiratory volume in 1 second ($r=0.43$, $p<0.01$) and Forced expiratory flow between 25% and 75% of vital capacity ($r=0.44$, $p<0.01$). A sub-group of 19 children was re-tested 10 minutes after β2 inhaled therapy. In 8 children (aged from 4 to 14 yrs), a significant change in FEV1 occurred (+15% or more), along with a significant decrease of Rint1 in 6 cases, whereas Rint2 failed to detect any significant change in all but one patient. Rint2 was falsely increased in one case. In conclusion Rint is a reliable technique for assessing airway obstruction in children.. A single rather than multiple interruptions during expiration seems to be more accurate. This technique is particularly interesting in children too young to perform standard spirometry.

COMPARISON OF TWO MEASUREMENT TECHNIQUES OF AIRWAY RESISTANCE IN CHILDREN AND ADULTS. V. Diaz, T. Carvelli and M. Boulé. Unité de physiologie respiratoire, Hôpital A. Trousseau, Paris.

Airflow interruption technique is often used in children to evaluate airway resistances because it is non-invasive, reproducible and requires minimal subject cooperation. Interruption resistance (Rint) is the ratio of the estimated alveolar pressure at the moment of airflow interruption to the flow that existed just prior to interruption. Among the different techniques of alveolar pressure estimation, we routinely use two different approaches in our laboratory: 1) back-extrapolation of the post occlusion curve until the time of half valve closure (Booster) and 2) pressure value obtained after oscillations (observed just following interruption) have cease (Dyn'R). Aim of the study: To compare measurement of Rint by back extrapolation (Booster) and end oscillation pressure (Dyn'R) in adults and children. Methods: 6 healthy adults and 11 children aged 5 to 11 years examined in our laboratory for various obstructive lung diseases were involved in this study. We recorded measurement of Rint by both techniques over 10 to 15 respiratory cycles in children and adults. Results: We found no significant difference ($p>0.05$) between Dyn'R and Booster measurement in children (respectively 0.71±0.16 vs 0.74±0.3 kPa/l/sec) as well as in adults (0.24±0.05 vs 0.21±0.03 kPa/l/sec). The variation coefficients did not differ significantly between both techniques either in children (Dyn'R vs Booster: 13.4±3.5 vs 12.8±4.4%) or adult groups (Dyn'R vs Booster: 11.6±4 vs 11.1±3.6%). Moreover within each technique, variation coefficients were not significantly different in children aged 5 to 7 years (n=5) and in children aged 9 to 11 years (n=6). Conclusion: Booster and Dyn'R do not give significantly different results with respect to airway resistance measurement and variation coefficient in children. From a practical point of view, with the Dyn'r technique, the user has to trigger each occlusion himself with a permanent control on tidal volume whereas in the Booster technique, a series of ten occlusions is automatically triggered on ten respiratory cycles and is therefore easier for the user but does not allow any control on the respiratory cycles chosen.

EVALUATION OF PASSIVE RESPIRATORY MECHANICS IN MECHANICALLY VENTILATED PREMATURE HEALTHY NEWBORN. D. Soupre*, MD. Donnou**, J. Sizum*, E. Girin**, M. Bellet**, JD. Giroux*, L. De Parscau*. * Department of Pediatric Intensive Care Unit, ** Respiratory Laboratory, CHU Brest, France.

Introduction : the study of pulmonary mechanics in newborn (NB) receiving mechanical ventilation is potentially helpful in evaluating respiratory distress severity and elucidating their pathophysiology, to survey response to treatment, or to optimize ventilator settings. It is now well recognized that measuring lung compliance with the esophageal balloon or catheter technique is unreliable in NB. Measurement by occlusion technique is an attractive alternative. Previous studies have reported values for Crs in healthy spontaneous breathing full-term NB. Rarely were measurements performed in premature NB without respiratory distress syndrome (RDS). Methods : respiratory functional investigations were performed using a Sensor Medics 2600 device (Sensor Medics, Yorba Linda, CA USA). Total respiratory resistance (Rrs) and compliance (Crs) were measured using single occlusion of the respiratory pathways at the end of inspiration. Tests were performed in the supine position during quiet sleep, without any sedation, and after tracheal suctioning. Results : 13 premature NB, gestational age over 28 weeks of gestation (mean 30,5 ± 2,7 weeks), and birth-weight over 940 grams (mean 1287 ± 417 grams) were studied. They were mechanically ventilated for apnea (n=4) cerebral asphyxia (n=3) or prematurity (n=6). Values of Crs (ml/cmH2O/Kg) and Rrs (cmH2O/ml/s) were as follows:

NB	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean
Age (d)	3	1	2	2	2	1	1	5	6	13	4	1	1	3,2±2,4
Crs	1,97	0,89	1,53	2,69	0,51	1,21	0,68	1,04	0,72	0,86	1,00	1,08	1,33	1,19±0,59
Rrs	132	221	187	150	184	217	385	248	145	188	135	168	155	193±65

Conclusion : the present results provide reference values for Crs in healthy premature NB. Since the occlusion technique, simple, reproducible and non invasive, is now used to measure passive total respiratory system mechanics in neonatal intensive care units, these values may be useful for studies of NB with RDS. Larger numbers of healthy premature NB need to be studied using this method to assert an inter and intra subject variability and the potential influence of factors such as postnatal and gestational age before reliable reference values can be established for this population.

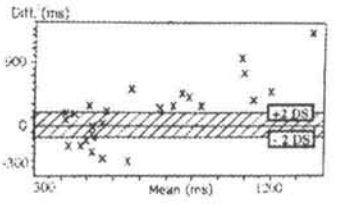
COMPARISON OF INTERRUPTER RESISTANCE WITH FLOW/VOLUME METHOD IN CHILDREN. M.F. Bertolani, F. Marotti, B.M. Bergamini, E. Ferraroni, M. De Guglielmo*, D. Ganazzi**. *Department of Gynecological, Obstetrical and Pediatric Sciences, ** Department of Internal Medicine, University of Modena, Italy.

Airway resistance measurement with the Interrupter Technique (RINT) has been proposed as a valid method for the evaluation of bronchial obstruction and, being easy to administer, could find its application in the uncooperative child (Ch). In order to evaluate the possible clinical application of RINT (Micro Medical MICROLAB 4000), this technique was compared with the Flow/Volume curve (F/V) (SPIROPRO 2000 Pabysch) in Ch (mean age 109.39±39 months). We studied : A) 54 Ch with normal F/V in baseline conditions; B) 50 asthmatic Ch before and after the exercise test (6' free running); C) 102 asthmatic Ch before and after inhalation of 200 µg salbutamol MDI. RINT was calculated, both with mouthpiece and face mask, as the average of 20 measurements for test A and 10 for tests B and C. Paired t test (significant for $p\leq0.05$) and Pearson correlation coefficient (significant for r^2 0.50) were calculated. Results : A) RINT vs FEV1, PEF, MEF 25, 50 and 75 were not correlated ($r^2<0.50$) even though r revealed an inverse trend (negative sign). Mean values with mouthpiece were higher than those with face mask ($p<0.005$). B) The change in mean values of expiratory flows was significant at 6', 12' and 20', while mean RINT change was significant only at 6' whether with mouthpiece or with face mask; r had a negative sign but $r^2<0.50$. C) The bronchodilator test showd significant changes in values ($p<0.001$) both with RINT and F/V. r had a negative sign but $r^2 < 0.50$. Conclusions : RINT measurements are not generally comparable with F/V curve values. Only the bronchodilator test showed significant changes. The mouthpiece measurements are much lower than those with face mask. The results are extremely non-homogeneous and we conclude that the RINT system used has to be improved before it can be applied in clinical practice.

PASSIVE EXPIRATORY FLOW VOLUME CURVE IS NOT AN ACCURATE METHOD TO MEASURE EXPIRATORY TIME CONSTANT. R. Vialet, S. Arnaud, A. Monnier, C. Martin, Y. Jammes. CHU Nord, Marseilles, France.

Introduction : Expiratory time constant (product of resistance (R) by compliance (C) : τ) is an important determinant of mechanical ventilation. The aim of this study was to compare the most simple method to measure τ (the end inspiratory occlusion technique : τrs) to the reference method (R and C measured by the Mead technique and static technique with a syringe, respectively: τref) during experimental bronchoconstriction induced with intravenous carbachol in mechanically ventilated rabbits. Methods: 7 New-Zealand

adult rabbits were anesthetized, paralyzed and underwent tracheostomy. Animals were mechanically ventilated with a tidal volume of 8ml/kg at frequency of 0.5 Hz. Flow was measured by a 00 Fleisch pneumotachograph, and pressures were measured in the airway and in the pleural space. Occlusions were made using a manual electrovanne. Calculations were made under basal conditions and after bronchoconstriction. τrs were the mean of measurements over 3 cycles. The accuracy of the evaluated technique was determined by plotting differences between techniques against mean. Results: Measurements yielded 28 different time constants, ranging from 0.30 to 1.96 s. Figure 1 shows a size dependent bias of τrs measurements: the larger the actual τ, the larger the systematic error between τrs. Discussion : It has recently been claimed[1] that τrs was an accurate method to estimate τ when compared to τ assessed by the linear least square technique. However, actual calculation of τ needs a static measurement of C as did in the present study. Even if end-inspiratory occlusion methods are quasi-static, measurements using this technique are dependent on the level of resistance, especially when R dramatically increases. Even if it can be useful in clinical practice, care must be taken in the interpretation of its measurements, especially if the resistances of the respiratory system are likely to be high.



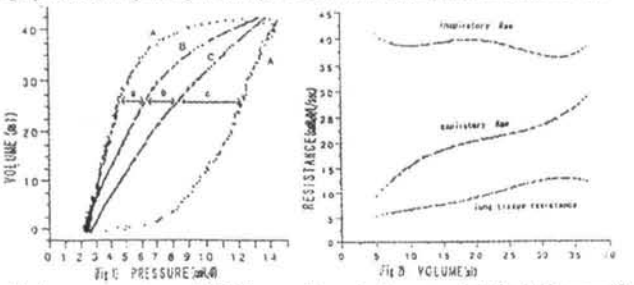
Reference : 1: Brunner JX et al. Crit Care Med. 1995; 23:1117-1122.

DETERMINATION OF ALVEOLAR RENEWAL INDEX IN INFANTS RECOVERING FROM ACUTE AIRWAY OBSTRUCTION. B. Bouferrache, C. Gaultier[1], N. Mejdoub, F. Cambier, M. Fréville, J.P. Libert. Unité de Recherches sur les Adaptations Physiologiques et Comportementales (EA1791), Faculté de Médecine, 3 rue des Louvels, 80036 Amiens cedex. [1]Service de Physiologie Hôpital Robert Debré, 48 Bd Sérurier, 75019 Paris.

The alveolar renewal index can be expressed as the ratio between alveolar volume (V_A) and functional residual capacity (FRC). Our goal was to study this ratio in infants recovering from acute airway obstruction and to compare it to that of a healthy population. The dynamic method used to measure FRC also allowed to evaluate V_A, contemporary. It is based on the modeling of the breath by breath variations of helium fractions when proceeding to a rebreathing maneuver. The measurement system includes a mass spectrometer and a pneumotachograph which is attached to a respiratory valve. This valve is controlled by a micro computer to switch the infant's ventilation from ambient air to a normoxic gas mixture with 10% of helium in nitrogen. The overall instrumental dead space is 4ml. Oxygen, carbon dioxide and helium gas fractions and ventilatory flow are recorded to process the mathematical model containing the parameters that are to be calculated. 14 healthy infants (group N, mean age : 2.8 ± 1.1 months) and 12 recovering from acute airway obstruction assessed from lung mechanics (group P, mean age : 3.5 ± 3.2 months) were tested sedated (chloralhydrate, 50ml.kg^{-1}) in supine position. The values of FRC obtained in group N were similar to those from literature V_T was greater in group P than in group N (9.9 ± 3.9 vs. 7.1 ± 0.9 ml.kg^{-1}, t_{24}=0.02). The same result was found for V_A between the two groups (6.0 ± 2.2 vs. 4.2 ± 0.09 ml.kg^{-1}, t_{24}=0.01). FRC was increased in P when compared to N (29.1 ± 7.7 vs. 21.5 ± 3.2 ml.kg^{-1}, t_{24}=0.002). Breathing frequency of the two groups was not different (30 ± 6 vs. 29 ± 7 breaths.min^{-1}, t_{24}=0.67), but there was no significant difference between N and P for V_A/FRC (0.17 ± 0.002 vs. 0.22 ± 0.016, t_{24}=0.12). In summary, it appears that infants recovering from chronic airway obstruction increase their tidal volume and in turn their alveolar volume to reach an alveolar renewal index of the same level as group N and therefore maintain normal gas exchange.

A NEW METHOD TO MEASURE LUNG TISSUE RESISTANCE. K. Muramatsu, K. Yukitake and T. Oda. Dept. Pediat. Tokushukai Hosp. and Fukuoka Univ. Fukuoka, Japan.

The conventional method for the calculation of pulmonary resistance assumes a linear compliance line connecting 0 flow points of end-inspiration and end-expiration, and further assumes that pressure to overcome the elastic forces of the lung during inspiration and expiration are equal at any point of tidal volume. Because of the hysteresis of the lung, this assumption is not true. Previous reports suggest that airway resistance (Raw) and pulmonary resistance (Rp) values are comparable and that tissue resistance (Rt) does not make a major contribution to pulmonary resistance. This means that static lung hysteresis is minimal. The aim of this study was to construct quasistatic lung hysteresis loop using a multiple occlusion method, and to measure Rt.



A: tidal pressure-volume (P-V) loop. B: expiratory quasistatic P-V curve C: inspiratory quasistatic P-V curve.

Method: A male mature mechanically ventilated infant suffering from asphyxia was studied. Multiple airway occlusions were performed at different volumes above end-expiratory level during inspiration and expiration, and the individual measurements were plotted as volume versus pressure. This quasistatic hysteresis curve was superimposed on the tidal P-V loop (Fig. 1). Calculations: inspiratory Raw=c/V, expiratory Raw=a/V, Rt=b/(insp. V + expi. V). Conclusion: The findings suggest that Rt is quite large and has to be taken into consideration (Fig. 2).

EVALUATION OF MEASUREMENT OF RESPIRATORY MECHANICS USING MULTINEAR REGRESSION ANALYSIS IN OVERDISTENDED MODEL. K. Yukitake, K. Muramasu, T. Aida and T. Oda. Department of Pediatrics, School of Medicine, Fukuoka University, Jukuoka, Japan.

Multilinear regression (MLR) analysis of flow and airway opening pressure (Pao) provide measurements of dynamic mechanics and also allows for the use of various models of respiratory systems, such as the linear single-compartment model (LSCM ; Pao = Ers*V + Rrs* V + EEP) and volume-dependent single-compartment model {VDSCM; Pao = (Ei + E2*V)*V + Rrs*V + EEP }, where Ers is dynamic respiratory system elastance, Rrs is dynamic respiratory resistance, EEP is the alveolar pressure at end expiration and (E1 + E2*V) represents total elastance. Recent studies proposed the use of %E2 {%E2 = 100* E2*Vt/(E1 + E2*Vt)} as the index of overdistension. The purpose of this study was 1) to evaluate the reliability of two different MLR analyses and 2) to examine whether %E2 can be used to estimate lung overdistension. Materials & Methods : five rabbits were ventilated at FiO2 1.0, inspiratory time 0.7 sec., respiratory rate 30/min. To obtain different degrees of lung inflation four types of peak inspiratory pressure (PIP: 30, 25, 20, and 15 cmH_2O) were applied at different positive end-expiratory pressures (PEEP : 7, 4, and 0 cmH_2O, respectively). Pao, V and V measured by integration of V were digitized with a sampling rate of 200 Hz and analyzed by both LSCM and VDSCM. Paired t tests were used for comparison of %E2. Statistical significance was accepted at the 5% level. Results: 1) The coefficient of determination (R2) deteriorated (<0.95) with increasing Vt when using LSCM. After applying VSCM the R2 were all >0.95. 2) The values of %E2 significantly decreased (*) from the %E2 at PIP/PEEP of 15/0 cmH_2O with the increase of PIP and/or PEEP. Within the same PIP group %E2 also significantly decreased (#) from %E2 at 0 PEEP with the increase of PEEP.

5E2 at different ventilator settings (Values are means ± SD)

PEEP (cmH_2O)	PIP = 15	PIP = 20	PIP = 25	PIP = 30
0	92.1 ± 20.3	117.2 ± 18.4	138.7 ± 17.3	143.8 ± 10.7
4	74.4 ± 19.1*#	96.8 ± 22.3#	117.0 ± 20.4#	103.1 ± 20.2#
7	38.8 ± 6.3*#	65.1 ± 22.9*#	63.1 ± 10.9*#	45.9 \ 12.0*#

In conclusion, 1) the MLR method using VDSCM yields a more accurate estimation of respiratory mechanics when the lung was overdistended but 2) the value of %E2 depends on which part of volume-pressure line the lung is ventilated, not merely on overdistension.

THE ECHOCARDIOGRAPHIC EVALUATION OF CARDIAC FUNCTIONS IN CHILDREN WITH OBSTRUCTIVE AIRWAY SYMPTOMS. Ö. Karaman, N. Ünal, A. Akçoral, N. Uzuner. Dokuz Eylül University School of Medicine Department of Pediatrics Izmir Turkey.

In this study, we demonstrated the effect of obstructive airway diseases on cardiac function. Bronchial asthma was selected as the example for diseases with lower airway obstructions while hypertrophic tonsils and/or

adenoids were selected as example of upper airway obstructions. Among the 55 children who were included in the study, 25 were bronchial asthma patients, 10 had hypertrophic tonsils and/or adenoids, 20 were healthy control patients. These 55 children were evaluated for right and left ventricle systolic and diastolic functions using M - mode two dimensional Doppler echocardiography. It was seen that systolic and diastolic functions of the heart were not affected by bronchial asthma and hypertrophic tonsils and adenoids in childhood. However, it was found that right ventricle diameter was increased in patients with hypertrophic tonsils and adenoids. In conclusion, it should be useful to monitor cardiac functions in patients especially with upper airway obstructive diseases.

A COMPARATIVE ASSESSMENT OF RIGHT HEART FUNCTION IN CHILDREN WITH CHRONIC PULMONARY DISEASES. A. Gichkin, V. Perley, N. Dundukov, V. Zhdanov, L. Jelenina. State Scientific Center of Pulmonology, St. Petersburg, Russia.

The aim of this study was examination of hemodynamics in 144 children aged 3 to 15 years with light and medium forms of diseases. Four groups of children were presented, Group 1 - patients with bronchial asthma in the out of acute period (n=25), as comparison group. Group 2 - patients with hypoplasia of the right or left lung (n=25), group 3 - patients with obliterating bronchitis, and group 4 - patients with mixed or pulmonary forms of cystic fibrosis. The following echo-Doppler parameters we remeasured: the systolic pressure in the pulmonary artery (PPAS) by Isobe method [1986], the right ventricle anterior wall velocity contraction (WVC), the right ventricle anterior wall velocity relaxation (WVR), and the right ventricle fraction of diastolic shortening (FDS). See table :

Parameter	Group 1	Group 2	Group 3	Group 4
PPAS (mmHG)	21.5 ± 0.6	23.4 ± 1.0	26.4 ± 1.0†	30.3 ± 0.8†
WVC (cm/s)	35.2 ± 2.5	33.7 ±2.6	36.3 ± 2.4	30.0 ± 1.6
WVR (cm/s)	45.9 ± 3.4	43.6 ±3.8	45.9 ± 3.6	40.3 ± 3.2
FDS	0.27 ± 0.02	0.23 ±0.02	0.32 ± 0.06	0.24 ± 0.01

† - $P < 0.01$ with compares group.

Conclusion. We have found that in the 3rd and 4th group, an increase in PPAS was shown. Ventricular functions were not distinguished statistically, which could indicate a high compensatory power of the right heart in children. It might be explained that the tendency for impaired functional levels in patients with cystic fibrosis is connected with general weakness of contractile ability of myocardium, as a result of toxic-infection diseases, overloading of the right heart or genetically determined impairment of the myocardial contractile function.