Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

KVD900-treated patients rated HAE attacks a little better or higher for 2 consecutive time points within 12 hours (83.0%) than placebo (50.9%) (P=0.0018). Median time to improvement was 1.6 hours (95% CI, 1.5–3.0) with KVD900 vs 9.0 hours (95% CI, 4.0–not calculable; $P \leq 0.0001$) with placebo. Within 12 and 24 hours, more patients on KVD900 reported an HAE attack as better or higher on PGI-C than placebo; median time to improvement was statistically significantly shorter with KVD900 compared with placebo (5.0 vs 15.0 hours; P=0.0036) (**Table**).

Conclusion: Treatment of HAE attacks with KVD900 achieved rapid plasma exposure and faster improvements in PROs compared with placebo.

	12 hours			24 hours		
	KVD900 (N=53)	PBO (N=53)	*P* value	KVD900 (N=53)	PBO (N=53)	*P* value
Patients reporting improvement, n %	31 (58.5%)	19 (35.8%)	0.0319*	36 (67.9%)	25 (47.2%)	0.0593*
Median time to improvement, hours (95% CI)	5.0 (2.1–NC)	NC (9.0-NC)	0.0003†	5.0 (2.1–15.0)	15.0 (9.0–23.5)	0.0036†

*Prescott's Test.
†Gehan's Generalized Wilcoxon Test.
CI, confidence interval; NC, not calculable; PBO, placebo.

Asthma, Other Lower Airway Disorders

A030

EFFECTS OF RHINOVIRUS ON BRONCHOALVEOLAR LAVAGE GRANULOCYTE AND CYTOKINE PATTERNS IN CHILDREN WITH SEVERE WHEEZE

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Introduction: Previous studies have demonstrated that lower respiratory pathogens are major triggers for wheezing in children, however, few studies have examined the effect of respiratory pathogens on inflammatory patterns in the lungs of children with severe wheeze.

Methods: Children ages 1 to <6 years with treatment refractory cough/wheeze (n=245), without clinical symptoms of recent/acute respiratory infection, underwent clinically indicated bronchoscopy and bronchoalveolar lavage (BAL).

Results: Rhinovirus (RV) was the most common pathogen detected (40%, n=98). The RV+ group was significantly younger than the RV- group (2.6 vs 3.1 years). In comparing BAL samples, RV+ children were more likely to have higher BAL total cell count (2.0 vs 1.4 x10^6), BAL eosinophils (13.8 vs 0.6 x10^4), and BAL neutrophils (424 vs 72 x10^4). The RV+ children were also more likely to have absent ciliary motion on fresh bronchial epithelial cells (21% vs 9%) and higher hs-CRP (0.5 vs 0.2 mg/dl). There was no difference in total serum IgE or blood absolute neutrophils and eosinophils between the two groups. Of the 12 patients that had BAL cytokines measured, the RV+ group (n=4) had higher TNF-a, TSLP and IL-17A.

Conclusion: The presence of RV in the lung fluid of preschool children with a history of refractory cough/wheeze but importantly without symptoms of recent respiratory infection is associated with a mixed eosinophilic/neutrophilic bronchoalveolitis, ciliary dysfunction, elevated blood hs-CRP, and T1/T2/T3 cytokine response. Increased BAL eosinophils and T2 cytokines, even in the absence of higher blood eosinophils or IgE, may identify those children at greater risk of developing persistent wheeze.

A031

OBESITY ALTERS PULMONARY MACROPHAGE LIPID METABOLISM AND FUNCTION DURING ASTHMA

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Introduction: Obesity associated asthma (OAA) is more severe and more difficult to treat than atopic asthma. Evidence suggests that the innate immune system is a key driver of OAA immunopathology. To understand the effects of obesity on lung macrophages and their role in OAA, we studied a model of OAA which recapitulates neutrophilic lung inflammation observed in humans.

Methods: We developed a murine model of OAA by treating lean or obese mice with two clinically-relevant innate immune stimuli; house dust mite extract (HDM) and lipopolysaccharide (LPS). Lung immune cell populations were examined by flow cytometry. The expression of genes relevant to OAA and lipid metabolism were examined by RT-qPCR of lung tissue and lung immune cells.

Results: In untreated mice, obesity increased lung macrophage lipid accumulation and expression of metabolic activation markers including CD9, but did not alter the proportions or numbers of other lung-resident innate immune cells. Treatment of both lean and obese mice with HDM and LPS induced a neutrophil-predominant lung inflammation that was exaggerated in obese mice. Transcriptional analysis revealed that obesity increased expression of lipid metabolic genes (e.g. *Plin2, Lpl, Lipa*) by lung immune cells, while treatment with HDM and LPS increased expression of cytokine genes associated with OAA (e.g. *Cxcl1/2, Tnfa, Ifng*).

Conclusion: Obesity alters markers of lung macrophage metabolism and immune function which may contribute to neutrophil-predominant inflammation observed during OAA. Ongoing studies will examine the molecular and cellular basis of these observations, and translate these findings to the study of children with OAA.

A032

LATINOS EXPERIENCE LONGER DURATION OF UNCONTROLLED ASTHMA AFTER COVID INFECTION

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Introduction: Minority populations suffered higher infection and death rates due to COVID-19 viral illness; asthma and allergic disease already disproportionately burdens racial minority populations in the US, warranting evaluation of population outcomes associated with COVID-19 infection.

Methods: Adult COVID-19-positive patients with a history of asthma evaluated at a university medical center between February and April, 2020 were entered in the study at the time of infection and followed for mean 6.8 months. Logistic regression was used to compare asthma-related outcomes after COVID-19 infection based on race/ethnicity and adjusted for demographics, allergic rhinitis status and inhaled corticosteroid use.

Results: Among 174 enrolled asthmatic COVID-19 patients, Latinos(n=23) had a significantly higher odds of developing asthma exacerbation after COVID-19 compared to non-Latinos; odds-ratio of 4.6 and 2.9 compared to blacks(n=44) and whites(n=111) respectively;p<0.05. Furthermore, Latinos had a significantly higher duration of asthma exacerbation symptoms compared to

non-Latinos; mean(SD) asthma symptom duration was 3.2(3.7), 1.59(1.9) and 1.4(1.5) weeks in Latino, non-Latino-white and non-Latino-black patients respectively; adjusted p=0.021. No difference occurred in likelihood of starting steroids for exacerbation relief nor initiating asthma step-up therapy between Latino, non-Latino-white and non-Latino-black subjects. All populations sought similar number of asthma-related provider visits, including clinic, emergency or telehealth, with mean(SD) 1.9(2.3) total visits per patient for exacerbation-related concerns.
Conclusions: Latinos experienced longer durations of asthma exacerbation following COVID-19 infection compared to non-Latinos, indicative of increased susceptibility of asthmatic Latino patients to prolonged respiratory inflammation after SARS-COV and/or other respiratory viruses, even in light of equal care utilization, and warrants further investigation.

Clinical Immunology, Immunodeficiency

A040

THE ROLE OF T-CELL IMMUNE DYSREGULATION IN THE PATHOGENESIS OF INDETERMINATE ACUTE HEPATITIS

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Introduction: Indeterminate pediatric acute liver failure (IND-PALF), a subset of PALF with unknown causes, is increasingly recognized to be driven by T-cell dysregulation and activation. However, IND-PALF immune dysregulation overlaps with other hyperinflammatory disorders such as Hemophagocytic lymphohistiocytosis (HLH). This is evidenced as some HLH patients have significant ALF, but HLH has much broader multisystem involvement. We aim to compare the immune dysregulation of HLH and IND-PALF to elucidate the common immunobiology of IND-PALF.
Methods: High dimension T-cell immunophenotyping and cytokine profiling(71-plex) were done for ALF(n=16), HLH(n=10), and control(n=10) peripheral blood samples.
Results: Despite the absence of pancytopenia, PALF had marked elevation of T-cell activation as evidenced by increased effector memory CD4 and CD8 T-cell expressing activation makers HLA-DR+CD38+. However, the amplitude of T-cell activation was lower in PALF relative to HLH. Activation in the CD8 compartment is greater than in CD4. Cytokine analysis revealed an increase in Interferon-g driven chemokines, CXCL-9 and CXCL-10. Also, levels of IL-1RA, IL-6, and IL-10 were increased in both ALF and HLH. Still, HLH, in general, has a more significant increase in inflammatory cytokine signature relative to ALF. We also identified unique cytokines like eotaxin, eotaxin-2, and CCL-17, significantly upregulated in PALF but not HLH suggesting despite overlap with HLH, some aspects of immunobiology are different in PALF.
Conclusion: Our data supported shared and uniquely different mechanisms for T-cell activation between HLH and ALF. We also identified a distinctive cytokine signature for IND-ALF that needs further investigation to explore the mechanism of the disease.

A041

DETECTION OF SARS-COV-2 ANTIBODIES IN IMMUNOGLOBULIN PRODUCTS

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Introduction: To date, there is limited data on SARS-CoV-2 antibodies in immunoglobulin (Ig) products used in primary immunodefiencies. Here we examined products for evidence of such antibodies.
Methods: 97 lots of 9 different brands of Ig used in the Mount Sinai infusion center or for home infusions were examined for IgG binding activities against recombinant SARS-CoV-2 receptor binding domain (RBD), spike, and nucleocapsid protein (NP) by ELISA. The area under the binding curves (AUC) was calculated and used for statistical analyses. Cut-off values were determined by the AUC of pre-pandemic samples.
Results: Significantly increased AUC values were observed in products with expiration dates of 2023 and 2024, compared to Ig products available in 2020 previously tested in our laboratory. Approximately 60% and 100% of the Ig products with expiration dates of 2023 and 2024 tested positive for anti-SARS-CoV-2 proteins, respectively. Four brands of Intravenous Ig products and one subcutaneous (SC) were found to have anti-SARS-CoV-2 proteins in the tested lots. Sample analysis of three other SC brands had no detectable anti-SARS-CoV-2 proteins. AUC values were significantly higher in products with later expiration dates used in our infusion center compared to products used in home infusions.
Conclusion: Overall, Ig products with an expiration date between 2023 - 2024 were found to have significantly higher binding activities against SARS-CoV-2 proteins in comparison to pre-pandemic products.

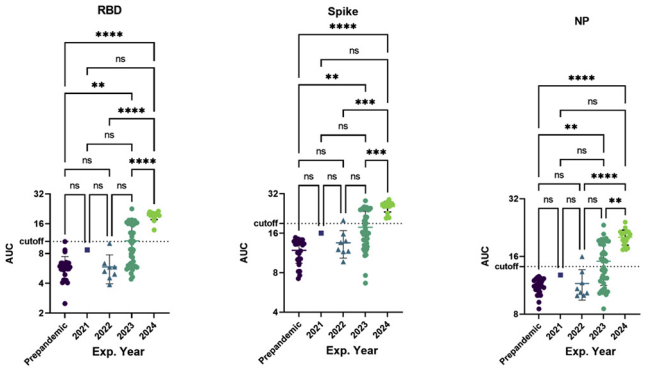

Figure 1. Showing Detection of Antibodies against SARS-CoV-2 proteins including receptor binding domain (RBD), spike, and nucleocapsid protein (NP) in Immunoglobulin products based on expiration date. Antibody detection was noted in products with expiration dates ranging between 2023 – 2024. There was no detectable SARS-CoV-2 antibodies in pre-pandemic product.

A042

TRENDS IN PEDIATRIC PRIMARY IMMUNODEFICIENCY: INCIDENCE, UTILIZATION, HEMATOPOIETIC STEM CELL TRANSPLANTATION, AND MORTALITY

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Introduction: Primary immunodeficiency disorders (PIDD) describe a myriad of diseases caused by inherited defects within the immune system. As the number of identified genetic defects associated with PIDD increases, understanding the incidence and outcomes of PIDD patients becomes imperative.
Objective: is to characterize the frequency of new diagnoses, patterns of healthcare utilization, rates of hematopoietic stem cell transplantation (HSCT), and mortality in pediatric patients with PIDD.
Methods: A retrospective cohort analysis of the Pediatric Health Information System (PHIS) database from 2004-2018 for pediatric inpatients with an ICD9/ICD10 code associated with PIDD.