ORIGINAL ARTICLE

Synopsis of non-communicable diseases in children admitted to the paediatric ward of the university of Nigeria teaching hospital (UNTH) Enugu, Nigeria: A ten year review

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ABSTRACT

Background: Non-communicable diseases are increasing worldwide due to rapidly changing lifestyles and socio-economic status. It is contributing significantly to the global burden of diseases. **Objective:** To determine the pattern of non-communicable diseases in children admitted into the Paediatrics ward in a tertiary health centre in Enugu. **Materials and Methods:** A review of admissions into the Paediatrics ward of the University of Nigeria Teaching Hospital Enugu, between January 1999 and December 2008 was done using the registry of admission and discharge. **Results:** The age range of patients admitted during the period was 2 months to 18 years (mean 5.27 ± 5.42 years). There were 1173 (59.6%) males and 796 (40.4%) females. Disorders of the haematological system accounted for 514 (23.3%) of the non-communicable diseases among the admissions, malignancies accounted for 424 (19.2%) among the admissions, whereas the renal, central nervous, and cardiovascular systems were involved in 282 (12.8%), 274 (12.4%), and 241 (10.9%) patients, respectively. There were 274 (12.4%) deaths and 1667 (75.5%) discharges while 38 (1.7%) were discharged against medical advice. Data on 221(10.2%) of the patients were reported missing. Malignancies contributed to 75 (27.3%) of the deaths, haematological disorders accounted for 44 (16%) whereas renal disorders and nutritional disorders contributed to 43 (15.7%) and 41 (15%) of the deaths, respectively. **Conclusion:** Non-communicable diseases affect children in our environment and contribute to morbidity and mortality in children. Strategies to prevent these diseases should be encouraged in order to avert the challenges of double burden of the diseases in children.

Key words: Children, non-communicable diseases, pattern

INTRODUCTION

Non-communicable diseases (NCDs) are increasing rapidly in both developing and developed countries.[1] This is probably due to rapid change of lifestyle.[1] The global burden of diseases is undergoing a rapid epidemiological transition shifting from infectious to NCDs.[2] The shift has been shown to occur faster in developing countries than in the industrialised nations.[3] Projections nevertheless still show that infections such as human immunodeficiency virus (HIV), tuberculosis, malaria will still contribute significantly to mortality and morbidity.[4] With increasing trend of NCDs especially in the sub-Saharan countries, these will constitute a double burden of disease, thereby putting another strain in our resource poor health delivery system.[4] Hence, there is need to study the pattern of NCDs in children with a view of instituting adequate preventive measures against them.

In 2008, about 60% of all the deaths in the world were due to NCDs whereas 80% of these deaths were among the low- and middle-income countries[5] This accounts for 47% of 1.49 billion years of healthy life lost to illness as measured in disability-adjusted life years (DALY). Not only is the epidemiologic transition more in developing countries, the peak prevalence occurs in the younger age group who, incidentally, are the economically productive group.[6]

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These countries may also lack the facilities for appropriate diagnosis and treatment.[4,7] In Nigeria, NCDs account for 21% of deaths with cardiovascular diseases, diabetes, chronic respiratory conditions, cancers and injuries as the major contributors.[8] It is predicted that by 2020, the NCDs will account for about 70% of the global burden of disease causing 7 out of every 10 deaths in developing countries compared to the current situation of less than half.[4] Thus this situation calls for action.

Otaigbe *et al.*,[9] in a study of profile of NCD in patients admitted in the children's ward in PortHarcourt found that in a year, 19.8% of all admissions were due to NCDs with male to female ratio of 1.4:1. The top five NCDs were sickle-cell disease (17.1%), malignancies (14.8%), renal disease (12.9%), and malnutrition (10%). This is at variance with findings in the adult population in the same centre, where hypertension (35.7%), diabetes (19.5%), and chronic respiratory conditions (16.5%) were the leading NCDs.[10] This, therefore, buttresses the fact that geographical and age group-specific NCD patterns should be established in order to direct efforts in their control, especially in resource-poor countries where modalities of treatment may not be readily available.

This study aimed to determine the pattern of NCD in children admitted in the Paediatric ward of the University of Nigeria Teaching Hospital (UNTH) Ituku/Ozalla Enugu.

MATERIALS AND METHODS

This was a retrospective study of NCDs in children admitted in the Paediatric ward of UNTH Ituku/Ozalla from January 1999-December 2008. The hospital was initially situated in a temporary site from inception until January 2007 when it was moved to the permanent site, which is about 22 km from the city centre. It serves as a referral tertiary centre for inhabitants of Enugu and its environment, which include the five eastern states of south-east Nigeria. The Paediatrics unit consists of two wards, newborn special unit ward and an emergency room. Admissions in the emergency room and newborn special care units were included until 2007 when the policy on newborn admission in the hospital changed and admissions of newborn from then (2007) were excluded from this study. Hospital admissions in the Paediatric unit are usually from the outpatient clinic, emergency room or transferred from the Paediatric surgical wards.

Medical records/admission records of all the patients with NCDs were retrieved. Information obtained from the admission records included patient's age, sex, address, date of admission, diagnosis, and hospital outcome. The diagnoses were verified from the final discharge diagnoses, which were entered centrally in the central medical record of the hospital. The diagnosis of each disease entity was made clinically and was confirmed by laboratory investigations. There were no cases where the admission and discharge diagnoses were different. The diagnoses were classified according to pathologic and systematic derangement. Specific keys were assigned to each category. Total number of admissions within the study period were also obtained. This was also collected from the admission records.

Data was analysed using Statistical Package for the Social Sciences software (SPSS version 19.0, Chicago IL, USA). An initial frequency count of all variables was done and represented in table. The mean and ranges of all the variables were calculated. The level of significance was set at $P \leq 0.05$.

RESULTS

The total number of patients admitted within the period was 8201, of which 1969 were the cases of NCDs giving a prevalence rate of 24.0%. The age range of patients was 2 months-18 years (mean 5.27 ± 5.42) Table 1. There were 1173 (59.6%) males and 796 females (40.4%) males:females 1.5:1 ($P < 0.01$). The highest frequency of NCDs was noted in the year 2004, while the lowest was in 2007 [Figures 1 and 2] Burkitt lymphoma constituted

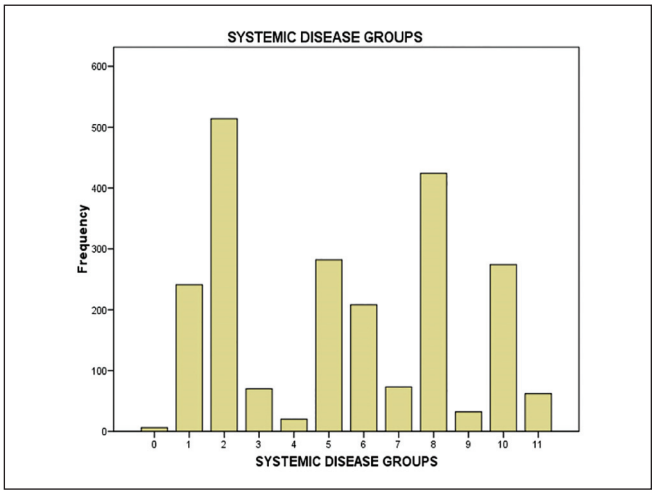

Figure 1: Bar chart showing the distribution of NCD across the years

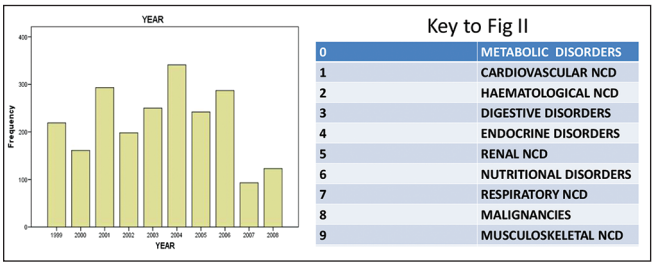

Figure 2: Bar chart showing the frequency distribution of systemic NCD disease

Table 1: Distribution of systemic diseases across the different age groups

Systemic diseases	Post neonatal (*n*) % (2 months - 1 year)	2-5 years (*n*)%	School age (6-9 years)	Adolescents (10-18 years)	*P* value
Cardiovascular	83 (18.2)	53 (10.3)	35 (9.9)	66 (12.6)	0.01*
Respiratory	30 (6.7)	18 (3.5)	50 (14.1)	10 (1.9)	0.01*
Digestive	17 (3.7)	12 (2.3)	8 (2.3)	16 (3.1)	0.418
Haematology	48 (10.5)	71 (13.8)	53 (15)	92 (17.6)	0.01*
Malignancy	26 (5.7)	151 (29.2)	134 (38)	109 (20.8)	0.01*
Nutritional	129 (28.2)	60 (11.6)	3 (0.9)	5 (0.96)	0.01*
Neurology	73 (16)	70 (13.6)	41 (11.6)	55 (10.5)	0.01*
Endocrine	2 (0.4)	0 (0)	1 (0.28)	15 (2.9)	0.01*
Metabolic	1 (0.2)	1 (0.2)	0 (0)	0 (0)	0.22*
Renals	18 (3.9)	62 (12)	62 (17.6)	137 (26.1)	0.01*
Musculoskeletal	7 (1.5)	7 (1.4)	4 (1.1)	10 (1.9)	0.415
Others	23 (5)	11 (2.1)	7 (2.0)	8 (1.5)	0.01*
Total	457 (100)	516 (100)	398 (100)	523 (100)	

142 (33.5%) of all malignancies while Nephrotic syndrome 119 (42.2%) of all renal disorders. There were 274 (12.4%) deaths, 1667 (75.5%) discharges while 38 (1.7%) were discharged against medical advice. Data on 221 (10.2%) of the patients were missing. Malignancies was responsible for 75 patients (27.3%), haematological disorders was responsible for 44 patients (16%) while renal and nutritional disorders were responsible for 43 patients (15.7%) and 41 patients (15%) of the deaths, respectively. The table shows that NCDs involving the cardiovascular, respiratory, haematological systems and nutritional disorders were more common in the younger age group, while diseases of the kidney and endocrine disorders were more common in the adolescents as compared to the younger age group $P < 0.01$. Malignancies were also less in infancy than in older children $P < 0.01$. Table 2 shows relative frequencies of NCD.

DISCUSSIONS

The observed prevalence of NCD in children in our centre over a ten-year period was 26.9% with a male preponderance. This is similar to the report of Otaigbe *et al.,*[9] in Portharcourt. Diseases of the haematological system and malignancies accounted for most of the cases of NCD in children. Similar findings had been reported by Otaigbe *et al*.[9] They also contributed to more than 40% of the deaths due to NCDs. Similar findings had been reported earlier[9] unlike the adult population where hypertension, diabetes, and chronic respiratory conditions were the major contributors to NCDs.[10,11] Older children and adolescents indulge in harmful drinking, smoking, and sedentary life style more than younger children, as this may explain the high incidence NCDs among them. In addition, episodes of hypertension and its complication which in turn can cause renal disease is more common among adolescents.[10]

The implication of this is that more emphasis should be laid on prevention of these diseases and early detection through the provision of adequate diagnostic facilities. The peak age group of occurrence of NCDs in children obtained in the study was between ages 6-11years. This is different from the peak age group of infectious diseases and their mortalities, which occur usually in the under-five age group.[12,13] There was an initial increasing trend of NCDs noted in the study, however, the decline in the later years was generally due to decline in patient turnout due to relocation of the hospital to a permanent site, which is about 22 km from the city. The distance initially and adversely influenced the general health care utilisation of the individuals in terms of cost of transportation and access.

Non-communicable diseases of renal and endocrine systems were noted to occur more significantly in the older children than the younger ones, while the NCDs of the respiratory systems, cardiovascular haematological and nutritional disorders were more common in the younger age group.

It has been documented that NCDs kill more than 36 million people each year. Moreover cardiovascular diseases account for most NCD deaths, or 17.3 million people annually, followed by cancers (7.6 million), respiratory diseases (4.2 million), and diabetes (1.3 million).[14,15]

This calls for different preventive approach across the age groups in terms of distribution of resources required for the control of these NCDs. The mortality rate for children with NCDs in this study was noted to be 12.4%. This figure is even less when compared with that obtained from other countries. For instance, mortality of 27% is seen in a country in African region and 25% in the Eastern Mediterranean region. It has been noted that the highest absolute number of deaths from NCDs will occur in the Western Pacific and South-East Asian regions.[16] The mortality caused by these NCDs cannot be overlooked as these mortalities are highly preventable. Although malignancies accounted for highest percentage of mortalities, these can be prevented through effective

Table 2: Showing relative frequencies of NCD

Systemic disorders	1 (%)	2 (%)	3 (%) Diseases (%)	4 (%)	5 (%)
Cardiovascular	Heart failure (34.9)	Vsd (24.9)	Rheumatic heart disease (10.4)	Tetralogy of fallot (6.2)	Other congenital heart diseases (14.9)
Respiratory	Asthma (35.6)	Atopy(11.0)	Chemical pneumonitis (9.6)	Foreign body asp (5.5)	Non infective pleural effusion (28.8)
Cns	Seizure disorder (31.4)	Hydrocephaly (10.2)	Encephalopathy (10.2)	Intracranial sol (10.2)	Cerebral palsy (5.5)
Digestive	Liver cirrhosis (14.2)	Biliary atresia (10)	Intestinal obstruction (11.4)	Upper gi bleeding (8.6)	Peptic ulcer (4.3)
Musculoskeletal	Juvnile rheumatoid athritis (34.4)	Cleft lip/palate (18.8)	Neurofibromatosis (3.1)	Dermatomyositis (3.1)	Polydactyl (3.1)
Malingnancy	Burkitt lymphoma (34.4)	Retinoblastoma (7.3)	Rhabdomyosarcoma (6.4)	All (5.4)	Hodgkins lymphoma (4.7)
Urogenital	Nephrotic syndrome (44.3)	Acute glomerular nephritis (24.5)	Chronic kidney disease (14.2)	Acute renal failure (7.8)	Obstructive uropathy (2.3)
Haematological	Sickle cell disease (34.24)	Auto immune haemolytic anaemia (2)	Haemophilia (1.6)	Other ha	G6pd deficiency (1.6)
Endocrine	Diabetes mellitus (70.0)	Thyrotoxicosis (10.0)	Adrenogenital syndrome (5.0)	Pituitary dwarfism (5.0)	Myxoedema (5.0)
Nutritional disorders	Marasmus (51.0)	Failure to thrive (17.3)	Kwashiokor (15.9)	Underweight malnutrion (9.1)	Marasmic kwashiokor (2.9)

HA – Haemolytic anaemia

screening and increase awareness, which may improve health-seeking behaviour of the people. These NCDs can also be treated to some extent. Treatment available in our setting includes the use of chemotherapy and radiography, and to a certain extent surgical procedures for malignancies and dialysis for acute renal failures.

We noted from this study that NCDs are more common in males than females. This may be due to a transcription factor that guards against diseases, which has been linked to X chromosome.[17] This transcription factor enhances production of antibodies and haematopoetic series through globin gene modification and transcription factor programming.[16] Females are doubly endowed. Sweitzer[18] noted that Endothelial B receptor (ETBR) releases endorphins. Males have less receptor when compared to females; hence, there are more episodes of diseases among them. This may also explain the male preponderance.

It is important to note that some of these NCDs may not be true NCDs, for instance in adults, HT, DM and CVD all increase with age and are related in part to lifestyle and environment. In children, some of these appear to be infection related, for example Burkitts and glomerulonephritis and so on. There exists no parallels between adults and paediatrics. However, these diseases require follow-up as opposed to usual infections and, therefore, require a better functioning and more accessible health system.

This study shows that NCDs affect children in our environment with an unacceptable prevalence. They contribute to morbidity and mortality in children. Strategies to prevent the emergence of these diseases should be encouraged in order to avert the challenges of double burden of diseases in children and also health care programmes in children should also be designed to cover the aspect of NCDs.

LIMITATION

Some of the data obtained in this study were incomplete and as such was not used for analysis. This is a retrospective study using hospital data, incomplete data associated with such studies were noted and has also been reported by Obu *et al*.[19] Children emergency room and intensive care unit records were not used, as this may have affected the distribution of the diseases.

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