Short Communication

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Disease Spectrum and Mortality in Hospitalized Children of Southern Iran

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Abstract

Objective: In medicine, especially in the field of pediatrics, it is necessary to perform regular epidemiologic studies in each geographic region. We designed this study in Nemazee Hospital, Shiraz (the major referral pediatric center in Southern Iran), to determine the disease spectrum, the mortality and also the rate of matching final diagnosis with the initial impression in pediatric wards.

Material & Methods: All children older than 1 month (2731) who were admitted in Nemazee Hospital (except for surgical wards), from November 2005 to October 2006, were studied through questionnaire interviewing on admission and were followed till discharge or expire time. In some instances that final diagnosis or cause of death was unclear; we followed them through their files in clinics up to 1 year.

Findings: Among 3057 admissions (related to 2731 patients), 56.8% were males (male to female ratio: 1.31). Patients' age was 31 days to 25 years (mean: 5.16 years, SD: 4.98 years) and the significant portion was less than 2 years (1270= 44.2%). Admission duration varied from 1 to 62 days (mean: 5 days, SD: 5.13 days). The most common diseases were seizure disorder (315=11.1%), pneumonia (235=7.7%), febrile convulsion (136=4.79%) and gastroenteritis (128=4.18%). 17.93% of admissions came out of Fars Province (18 Provinces) with digestive system (19.1%), infectious (18.5%) and nervous system diseases (15.0%) as the most frequent referred patients. In 90.6% of admissions final diagnosis was clarified in the hospital (ranged from 86.45% in infectious ward to 93.4% in cardiology ward) (*P*=0.01). The total mortality rate was 5.30%; this rate was 9.49% for patients younger than 1 year and 5.0% in older patients (*P*<0.001).

Conclusion: The most common age of admission in pediatric wards was less than one year. The most common diseases were seizure disorder, pneumonia and gastroenteritis. Congenital heart disease, sepsis and pneumonia were the most common diseases leading to death.

Key Words: Pediatric, Hospitalization, Common Diseases, Diagnosis, Mortality

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Introduction

In medicine, especially in the field of pediatrics, it is necessary to know epidemiologic pattern of diseases and causes of death in each geographic area and in different age groups. The health problems of infants, children and teenagers vary widely among the nations and depend on: 1) the prevalence and ecology of infectious agents and their hosts; 2) climate and geography; 3) educational, economical, social and cultural considerations; 4) stage of industrialization and urbanization; and 5) in many instances, the gene frequencies for some disorders.[1]

As a result of such studies, health system management, including prevention, treatment and continuous education of the physicians, hospital staff and general population can be done appropriately. Therefore, we designed this study in Nemazee Hospital, the major referral pediatric center in Southern Iran, affiliated to Shiraz University of Medical Sciences, to determine the disease spectrum, mortality rate, causes of death and also to demonstrate the rate of matching final diagnosis with the initial impression in pediatric wards.

Material & Methods

All children older than 1 month (2731) who were admitted in Nemazee Hospital from November 2005 to October 2006 were studied for disease type, mortality rate, final diagnosis and its agreement with the impression at the time of admission. All the patients and/or their historians were interviewed through a questionnaire on admission and were followed till discharge or death time, if they expired. In some patients, the final diagnosis or cause of death was unclear at the time of discharge; therefore, follow up in the clinic up to completion of the workups continued.

The patients were divided into 5 groups according to age: 1) 31 days to 1 year; 2) 1 to 2 years; 3) 2 to 6 years; 4) 6 to 14 years; 5) 14 years and more. Division of disease categories was done on the base of ICD-10 which includes 21 groups of diseases. Finally, the data were analyzed by SPSS program and Chi-square (X^2) test.

Findings

Among 2731 patients studied, 326 had more than one admission, so comprising total admissions of 3057. Of total admissions, 1736 (56.8%) were males with male to female ratio (M/F) of 1.31, but this ratio reversed for subsequent admissions (0.9). The most common group of diseases were the infectious category (590 cases=21.3%). However, the most common diseases were seizure disorder (315=10.3%), pneumonia (235=7.7%), febrile convulsion (136=4.4%) and gastroenteritis (128=4.2%). In all of these common diseases, except for gastroenteritis, M/F ratio was more than 1.

The patients' age in the first admission varied from 31 days to 25 years (mean=5.2 years, SD=5.0) and a significant proportion was less or equal 2 years old (1270=44.2%) (Fig 1). Seizure disorder was the most common disease in all age groups except for 1 to 2 years, in which febrile convulsion (11.1%) was more frequent (8.3%). 45 admissions (1.5%) were non-Iranian subjects and overall, 2509 cases (82.1%) were residents of Fars Province, about half of whom were from Shiraz and Marvdasht. Others referred from 18 Provinces, among which Boushehr (200 cases= 6.5%) and Kohkilouyeh. Bouyer Ahmad (142 cases =4.6%) had the most frequency.

The most common diseases of these Provinces were digestive system (33=21.2%), infectious (75=13.7%) and endocrine diseases (55=10.0%). Admission duration varied from 1 to 62 days (mean=5.0 days, SD=5.1) and the most and least durations were in Infectious (mean=8.6) and Pediatric Emergency and Neurology wards (mean=3.9). Overall, fever was the most common chief complaint on admissions (13.1%).

In 2771 cases (90.6%), the final diagnosis was clarified, which ranged from 86.4% (Infectious Ward) to 93.4% (Cardiology Ward) (P=0.01). The primary and final diagnoses were the same in 2292 cases (75.0%; CI=0.73-0.76) and this agreement was the most in the Pediatric
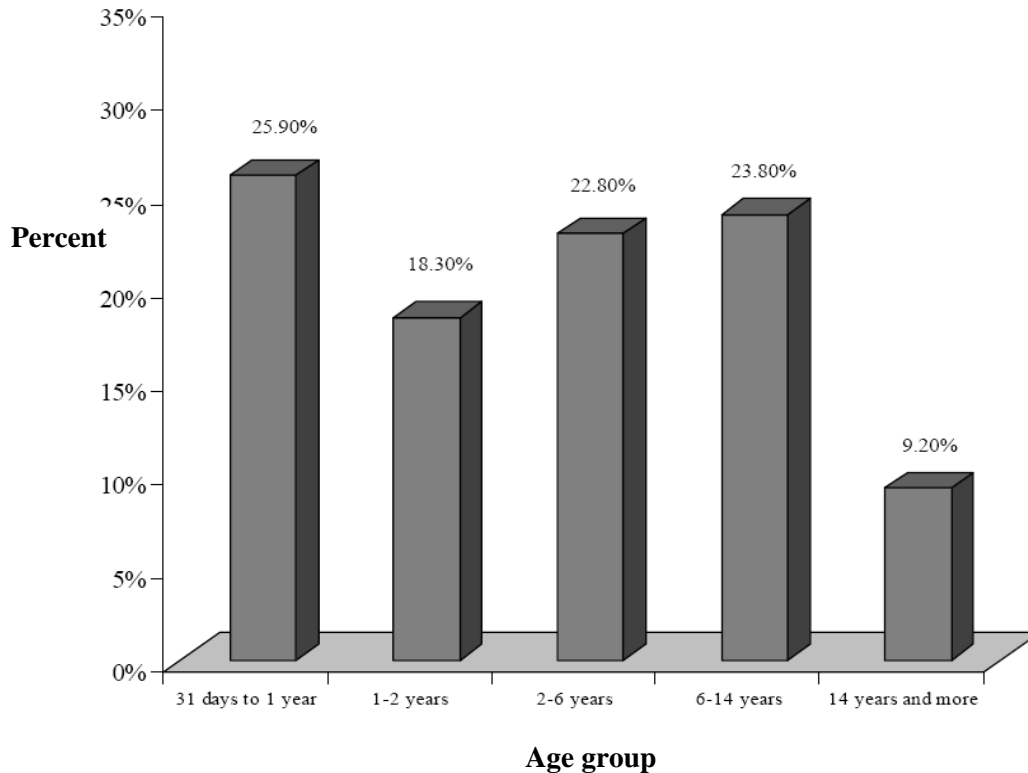
Fig 1- Age distribution of admitted children in Namazee Hospital of Shiraz
from November 2005 to October 2006

Emergency and Neurology wards (78.5%; CI=0.75-0.81) and the least in the Gastro-enterology ward (47.6%; CI=0.43-0.52). The admission rate in different seasons was not significant and the most frequent disease in all seasons was seizure disorder, except for pneumonia (76=10.6%) in winter.

The total mortality rate was 5.3 (169 cases). This rate was 9.5% (67 cases) in ages less than 1 year, and 5.0% (102 cases) in older patients (*P*<0.001). The mortality rate in male and female was 5.1% and 6.0%, respectively (*P*=0.3). On the first day of admission, 36.7% of the mortalities (62 cases) happened. The most common causes of death were congenital heart diseases (24=14.2%), sepsis (24=14.2%) and pneumonia (9=5.3%), respectively. Ninety eight deaths (57.9%) occurred in PICU, where the most common causes of death were sepsis (14.3%), pneumonia (9=9.2%) and blood malignancies (9=9.2%).

Discussion

Unfortunately, there is not enough information about hospital admissions in different countries to be compared to this study. In general, the number of male patients was more than females, but from the 2nd admissions, M/F ratio was 0.9 which can be due to a higher prevalence of UTI in female. The age group of less than 2 years was the most common age on admission and the majority of them were younger than 1 year, which is in agreement with previous studies.[2] This indicates that this age group has a higher risk for diseases.

Overall and in the age group of more than 2 years, seizure disorders (excluding febrile convulsions) were the most common diseases, but in a previous study in Shiraz[2], pneumonia (16%) was the most common and convulsion (including febrile type) were the 10th cause of admission (3.3%). In one unpublished data from

Shariati Hospital of Fasa, gastroenteritis, pneumonia and convulsion were the most common diseases (Karimi M and his colleagues). In another study at the Eldoret District Hospital of Kenya, malaria was the most common disease and pneumonia, gastroenteritis and measles comprised 75% of the diseases, while convulsion (including febrile type) was the 15th cause of admission.[3]

In examination of about 968 pediatric patients on the island Dominica, 49.27% had infectious diseases.[4] these differences may be due to controlling of infectious diseases during the last few years. Although between 1980 and 2000, there was dramatic increase in the percentage of children immunized in developing countries, however immunizations for diseases such as hepatitis, (except for type B), hemophilus influenzae and varicella are rarely available in developing world.[5]

The most and least final diagnosis clarification belonged to Cardiology and Infectious wards, respectively, that can be due to more diagnostic modalities and several admissions on the background disease in the former. In close follow up of 461 infants 0-2-year old admitted in National Hospital in Niame (Niger), the great proportion of deaths occurred during the first 24 hr of hospitalization, while in our study this rate was only 36.68%, which can be due to better management or less severity of diseases on admissions.[6]

As expected, febrile convulsion frequency was the highest in the age group of 1-2 year[7]. Digestive system diseases (21.16%) were the most common cause of referral from other provinces which can be due to absence of pediatric GI-specialists in the majority of these provinces or referral for liver transplantation in Shiraz, which is the only center at present in Iran. As expected, the highest mortality rates were in PICU (34.6%) and Cardiology ward (11.4%). Congenital heart diseases, sepsis and pneumonia were the leading causes of death; since there is not adequate experience, facilities in the operating rooms and economical ability of families for on time operation of congenital heart diseases. In this study, case fatality rate of sepsis was 42.8%, while this rate in different studies were 9.8%, 98% and 31%.[8-10] These differences

may be due to age, underlying diseases and microorganisms leading to sepsis[9], which varied widely in these studies.

Separation of pediatric hematology-oncology ward from Nemazee Hospital should be mentioned as the limitation of this study and only some of the patients of this field were admitted in Nemazee Hospital and included in the study.

Conclusion

The most common age of admission in pediatric wards was less than one year. The most common diseases were seizure disorder, pneumonia and gastroenteritis. Congenital heart disease, sepsis and pneumonia were the most common diseases leading to death.

Acknowledgement

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