Morbidity Profile of Children Admitted to a Regional Hospital of Hilly Region

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Abstract
Introduction: *Annual child mortality rates in India have decreased between 1.7% and 2.3% in the last two decades. Still, the United Nations (UN) estimates that about 2.35 million (M) children died in India in 2005. This corresponds to over 20% of the world's under-five deaths, more than any other country. Children illness requires more frequent hospital care and younger children are more vulnerable to mortality. This study was, therefore, undertaken to evaluate the morbidity pattern in hospitalized children less than twelve years with all disease in a regional hospital of hilly region of India.*
Methods: *This was a hospital data based retrospective observational study carried out from August 2016 to July 2017. Hospitalized children were enrolled for the study and evaluated for morbid events leading to hospitalization.*
Results: *A total of 1068 patients were admitted in the pediatric ward of the hospital within the period under review. Out of these boys constituted 62.26% (n=665) boys and 37.73% (n=403) girls with boys to girls preponderance ratio of 1.65:1. The age group less than 5 years constituted the main chunk with total 784 (73.40%) admissions. Seasonal variation in admission rate was also documented with maximum 378 (35.39%) children admitted during hot weather season (July-Sept). Among morbidities respiratory tract infection was the leading cause with 300 (28.08%) patients followed by patients with gastrointestinal diseases 214 (20.03%). It was found that febrile seizures were quite prevalent in this region with 81 (7.58%) admissions.*
Conclusion: *Research on morbidity is rather scanty. Yet it is very important and useful indicator of the health status of the people. The concept morbidity has more than one meaning. The findings indicate that there is a need to improve utilization of primary health care services including the vital MCH services for better child health and survival.*

Introduction

India is a large country with huge variations in health indicators across states and districts of the country[1]. The Indian population consists of many communities with different cultures and habits and widely varying literacy rates. The morbidity and mortality pattern across India varies significantly as would be expected from the wide health and health determinant disparity spread across length and breadth of India[2, 3]. Annual child mortality rates in India have decreased between 1.7% and 2.3% in the last two decades[4,5]. Still, the United

Nations (UN) estimates that about 2.35 million (M) children died in India in 2005. This corresponds to over 20% of the world's under-five deaths, more than any other country[4,6]. Infectious diseases like diarrhoea, acute respiratory infections, malaria and whooping cough have been found to be the world's leading cause of morbidity and premature death especially in children in developing countries. 6.9% of deaths in children were attributed to respiratory infections, 2.2% to malarial fever and 2.0% to childhood diseases[7]. Two major infective illnesses in children are respiratory tract infection and diarrhoea[8,9]. In India, common morbidities among children are fever, acute respiratory infections, diarrhoea and malnutrition. The present study highlights the status of different types of morbidities in a regional hospital. This is the first study in Himachal Pradesh amongst children below 12 years of age with all causes of morbidity.

Methodology

Study Design and Period: It is a hospital data based retrospective study from August2016 to July 2017 for a period of one year.

Study Place: It was done at regional hospital Solan, Himachal Pradesh which caters population of district Solan and adjoining areas of district Sirmour and Shimla.

Inclusion Criteria: All children admitted in pediatric ward under 12 years of age.

Exclusion Criteria: Infants less than one month of age who were admitted to SNCU.

Statistical Analysis: was done using Microsoft Office Excel©. The data entry on morbidity and mortality of all patients is routinely done in the medical records of respective wards of hospital. This data has information on socio-demographic, age, sex, diagnosis, treatment, condition at discharge and cause of death.

Results

Table 1: Demographic Profile of Admitted Children (n= 1068)

Gender	No. of Children	Total
Male	665 (62.26%)	
Female	403 (37.73%)	1068 (100%)
Age Wise Distribution		
<1y	232 (21.72%)	
1-5y	552 (51.68%)	1068 (100%)
6-12y	284 (26.59%)	
Area Wise Distribution		
Solan	660 (61.79%)	
Sirmour	341 (31.92%)	
Shimla	52 (4.86%)	1068 (100%)
Other Places	15 (1.40%)	

A total of 1068 patients were admitted in the pediatric ward of the hospital within the period under review. Out of these 62.26% (n=665) were boys and 37.73% (n=403) were girls with boys to girls ratio of 1.65:1. Out of the total 1068 patients, 660 (61.79%) children belonged to district Solan, 341 (31.92%) children were from district Sirmour, 52 (4.86%) were from district Shimla and only 15 (1.40%) from other regions. 232 (21.72%) were infants (<1 year), 552 (51.68%) between (1-5 years) and 284 (26.59%) were between (6-12 years) of age. The age group less than 5 years constituted the main chunk with total 784 (73.40%) admissions.

Table 2: Seasonal Variation of Children Admitted (n= 1068)

Season	Month	No. of Children	Total
Winter (Dec-Jan)	Dec	76 (7.11%)	199 (18.63%)
	Jan	64 (5.99%)	
	Feb	59 (5.92%)	
Spring (March-April)	March	93 (8.70%)	171 (16.01%)
	April	78 (7.30%)	
Hot Dry (May-June)	May	83 (7.77%)	180 (16.85%)
	June	97 (9.08%)	
Hot Wet (July-Sept)	July	136 (12.73%)	378 (35.39%)
	August	117 (10.95%)	
	Sept	125 (11.70%)	
Autumn (Oct-Nov)	Oct	91 (8.52%)	140 (13.10%)
	Nov	49 (4.58%)	
Total		1068 (100%)	1068 (100%)

Seasonal variation in admission rate was also observed in this study. The maximum number of children 378(35.39%) got admitted during hot wet

season (July-Sept) followed by admissions 199 (18.63%) in winter (Dec-Feb), 180 (16.85%) in hot-dry season (May-June), 171 (16.02%) in springs (March-April) and minimum admission 140(13.10%) during autumn (Oct-Nov).

Table 3: Ten Leading Causes of Morbidities (n= 1068)

Sr.No.	Morbidity	No. of Children
1.	Pneumonia	117 (10.95%)
2.	Diarrhoea	116 (10.86%)
3.	Other Respiratory Tract Infections	183 (17.13%)
4.	Other Gastrointestinal Diseases	98 (9.17%)
5.	Febrile Seizures	81 (7.58%)
6.	Seizures (Other)	22 (2.05%)
7.	Asthma	39 (3.65%)
8.	Poisoning	18 (1.68%)
9.	Snake bite	9 (0.84%)
10.	Others	385 (36.04%)
	Total	1068 (100%)

Among morbidities respiratory tract infection was the leading cause with 300(28.08%) patients which included pneumonia 117(10.95%) and other respiratory tract infections 183(17.13%) followed by patients with gastrointestinal diseases 214 (20.03%) comprised of diarrhoea patients 116 (10.86%) and other gastro-intestinal manifestations 98 (9.17%). It was found that febrile seizures were quite prevalent in this region with 81(7.58%) admissions. Remaining patients were of asthma 39(3.65%), seizures 22(2.05%), poisoning 18(1.68%), snakebite 9(0.84%) and other system involvement like eye, ear, skin etc. 385 (36.04%).

Table 4: Outcome of Children (n= 1068)

Discharge	1050 (98.31%)
LAMA	8 (0.74%)
Referred	10 (0.93%)
Died	0 (0%)
Total	1068 (100%)

Out of total patients 1050 (98.31%) were discharged, 10(0.93%) were referred to higher institutes due to unavailability of diagnostic work up and ventilators and 8(0.74%) left against medical advice**.**

Discussion

This retrospective hospital based study evaluated one year of non-neonatal pediatric admissions at regional hospital. This analysis was limited to hospital admissions only, which did not include patients seen in the emergency and outpatients departments (OPD) per se. The present study shows that, more boys than girls were hospitalized with boys to girls preponderance ratio of 1.65:1. It is possible that parents have a higher acceptance of hospital admissions for their ill sons than for ill daughters. This is probably because of the cultural parental preference for male children .However, the probability of morbidity in females not being reported should also be considered. Similar finding of male predominance over females has been quoted by Lakshmi[7], by Bhansali[10], Paramita S[11]. In our study, it is observed that the highest number of morbidity among the children were in age group (<5 years) accounted 73.40% of all admissions. More boys than girls were admitted for all age groups. The infants are more prone for illnesses because of factors like decreasing immunity and associated malnutrition as a result of faulty weaning and in adequate food intake. This is in accordance with the observations by Lakshmi[7] and Panda P[12]. Paramita S has reported malnutrition in under-fives having low birth weight and who have more than 2 siblings[11]. Among morbidities respiratory tract infection was the leading cause with 300 (28.08%) patients which included pneumonia 117(10.95%) and other respiratory tract infections 183(17.13%) followed by patients with gastrointestinal diseases 214(20.03%) comprised of diarrhoea patients 116(10.86%) and other gastro-intestinal manifestations 98(9.17%). In brief together they account for almost half the burden of illnesses in admitted children. Venketesh *et al* also observed ARI to account for 42% of morbidity followed by diarrhoea (13.6%) and skin disease (11.8%)[13]. A study amongst under-fives in the Anganwadis also reported the above as most common cause of morbidity[14]. This indicates that the burden of these communicable diseases is still prevailing

even at present. It was found that febrile seizures were quite prevalent in this region with 81(7.58%) admissions which is similar to the study done by Vanderberg BJ with prevalence of 5-10% in Indian kids[15]. Contrary to this finding, study by Shinnar S found that febrile seizures occur in 2 to 5% of children younger than age 5 years with a peak incidence in the second year of life[16]. There were 39(3.65%) admissions of children with asthma which is less than study done by Pal et al[17]. The reason could be patients of asthma are treated on OPD basis and admitted only during severe exacerbation. Present study shows that the rate of hospitalisation was significantly higher during the hot- wet season 378(35.39%) than the winter 199(18.63%), hot-dry180 (16.85%), spring 171(16%) and autumn (13.10%). This is the similar to findings from study done at Uttrakhand [18]. Further investigation is required to determine the cause of these trends.

Strengths of the study
This is the first study in the study area to highlight the morbidity pattern in hospitalized children of age below 12 years.

Limitation of study
This study was a hospital based study and hence does not represent the true rate of events for children in the general population.

Conclusion
The present study only highlights the status of different types of morbidities in a regional hospital. This is the first study in Himachal Pradesh amongst admitted children of pediatric age group with all causes of morbidity to highlights the morbidity pattern. The findings indicate that there is a need to improve utilization of primary health care services including the vital MCH services for better child health and survival. The regrettable side to the issue is that most of the morbidities are largely preventable by simple interventions like immunization, adequate nutrition promotion of hygienic practices, through proper health education to their parents. Community health workers should also be trained adequately.

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