A study of pattern of admissions and outcome in pediatric intensive care unit at rural Haryana.

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Abstract

Background: Data obtained from the pattern of admission and outcome in a PICU is beneficial in re-evaluating existing services and improving facilities and patient care.

Method: We analyzed the records of PICU patients with regard to their age, sex, cause of admission and their outcome over one year period since Feb 2016 to January 2017. Patients who left the hospital without advice (LAMA) were also noted.

Result: Total 799 children were admitted during this period. Maximum number of patients belonged to adolescent age group between 10 to 19 years followed by infants and preschool children (3-6 years). Male: Female ratio was 1.3:1. Overall mortality rate was 5.13%. Maximum numbers of deaths were due to infections followed by CNS disorders.

Conclusions: Mortality rate was relatively low in our study compared with many studies. Cause of admissions and mortality were maximum with infections. High LAMA rate in my study may have contributed in bias in mortality rate.

Keywords: PICU, infections, admission, mortality

Introduction:

Gradually   management of sick and critical pediatric patients is significantly growing day to day. Advancement of resources and better skilled hands in this area are continuously growing .In view of management of children in PICU it becomes important to know the patterns of patients get admitted in particular geographical area and also their probable outcome This study aims to know the same so that more appropriate uses of resources could be applied to reduce the mortality and morbidity in sick and critical pediatric patients.

The major causes of mortality in children in developing countries are infections, diarrhea   and other preventable diseases. Care of sick and critical children in developing countries are resource related and challenging. The aim of this study to see the profile and recent trend of patients in our rural tertiary care centre, so that resources could be

maximally utilized. The study will also reflect the magnitude of illnesses in this particular area. Child mortality is a sensitive indicator of a country s development and evidence of its priorities and values. According to NFHS-4(2015), under five mortality rate in India is 47/1000 live birth.[1]. Malnutrition is one of the major causes of fewer than five mortality.

Aim of our study to evaluate pattern of diseases coming and their outcome in PICU his so that similar studies in future can be compared specially with relevance to outcome improvement. Secondary aim of this study was to evaluate burden and any gap in the management of cases.

Material and Methods:

This study is a retrospective observational study conducted at Pediatric Intensive Care Unit in Maharashi Markandeshwar Institute of Medical Sciences Mullana, Haryana, India in which records of patients aged from 2 months to 19 years(as hospital protocol) admitted over one year period since February 2016 to January 2017 were analyzed. All patients fulfilling criteria of PICU admission were included. Patients having incomplete data were excluded. Further data were recorded in predefined performa that included all details such as age ,sex , diagnosis, associated co-morbidities , any complications and deaths . Diagnosis were made as per their standard definitions. In case of multisystem involvement ,the primary system were taken as system involved. This Pediatric Intensive Care Unit has 12 beds equipped with the entire standard requirement as recommended by the Indian Academy of Pediatrics guidelines. All the patients were managed by standard guidelines of WHO, IAP and guidelines recommended by specialty academic body. Empirical antibiotics were used as per Our PICU protocol as well as guided by previous culture and sensitivity pattern in PICU.

Statistical analysis for categorical variables was done by chi-square test. A p value less than 0.05 were taken as significant.

Results:

Table1. Showing number of admitted child in relation to different age groups.

Age groups	No .of cases	percentage	P value
2 months - < 12 months(infants)	114	14.26	<0.00001
1 – < 3 year(toddlers)	84	10.51	
3 year – < 6 years(preschool)	114	14.26	
6 years – < 10 years(school)	143	17.89	
More than 10 years – 19 years(adolescent)	344	43	
Total	799	100	

Table2. Showing mortality pattern in relation to different age groups.

Age groups	No. of deaths	Percentage	P value
infant	9	21.95	0.5952
toddler	7	17.07	
Pre-school	6	14.63	
school	7	17.07	
adolescent	12	29.26	
41	41	100	

Table3. Showing seasonal variation in admission and mortality.

Months	No. of cases with percentage	Males	Females	LAMA with percentage	Deaths with percentage
February 16	25(3.12)	10	15	2(2.98)	0(0)
March 16	23(2.87)	14	9	2 (2.98)	2 (4.87)
April 16	53(6.63)	25	28	1(1.49)	2(4.87)
May 16	64(8.01)	32	32	4 (5.97)	1(2.43)
June 16	69(8.63)	40	29	7 (10.44)	3(7.31)
July 16	69(8.63)	35	34	2 (2.98)	1(2.43)
August 16	119(14.89)	72	47	8 (11.94)	7(17.07)
September 16	98(12.26)	54	44	8(11.94)	11(26.82)
October 16	105(13.14)	60	45	12(17.88)	7(17.07)
November 16	69(8.63)	44	25	9 (13.41)	4 (9.74)
December 16	47(5.88)	29	18	2 (2.98)	1 (2.43)
January 17	58(7.25)	40	18	10 (14.92)	2 (4.87)
Total	799(100)	455	344	67 (100)	41 (100)

Table4. Showing number of patients admitted in relation to system involved.

Systems involved	Total no. of patients	P value
Respiratory	85(10.6%)	<0.00001
CNS	142 (17.77%)	
Infectious disease	143(17.89%)	
Surgical	114 (14.26%)	
Gastrointestinal	77 (9.6%)	
Cardiovascular	12(1.50%)	
Poisoning	11(1.37%)	
Renal	31(3.87%)	
Hematological	17(2.12%)	
Metabolic	14(1.75%)	
Others	153(19.14%)	
Total	799(100%)	

Table5. Showing mortality pattern in relation to system or groups of children.

Systems involved	Expired	percentage	P value
Respiratory	4	9.7	<0.00001
CNS	5	12.19	
Infectious disease	14	34.14	
Surgical	3	7.30	
Gastrointestinal	1	2.43	
Cardiovascular	1	2.43	
Poisoning	0	00	
Renal	3	7.30	
Hematological	1	2.43	
Metabolic	0	00	
Others	9	21.60	
Total	41	100	

Table 1. shows total number of patients admitted during this one year period since February2016 to January2017 were 799. Maximum number of cases admitted were in age group of adolescents followed by infants and preschool children and was found statistically significant Out of total 799, 455 were male and female were 344,

with a male to female ratio 1.32:1. Table2. shows the mortality pattern in different age groups and differences were found statistically non-significant. Table3. shows maximum number of cases admitted in the month of August followed by in October and September. Table 4. shows number of admitted cases in relation to system or groups involved. Maximum number of cases attributed to infections followed by central nervous system disorders and the differences were found statistically significant. Table 5. Shows mortality pattern with regard to system or group of diseases and the differences in mortality were found significant. Overall mortality was 5.13%. Highest mortality was seen in adolescent age group followed by infants . With regard to system involved maximum ortality were seen with infections followed by CNS disorders.

Discussion

In last two decades management of sick and critical children improved significantly, with the advancement of management in pediatric ICU. In India, the data of PICU admissions and their outcomes are relatively scarce. In most of the studies done in India, the maximum number of children admitted were with infections specially malaria, dengue, septicemia and meningitis. In our study also the most common causes of admission were infections (17.89 %) although we could not analyzed each individual case and second with CNS diseases (17.77 %). Kapil and Bagga reported septicemia (14.8%) as the commonest indication for admission in PICU.[2] , Significant variation of admission pattern were reported in our study as maximum number of patients admitted were from July to October specially maximally in August and October.. Siddiqui et al done study on1919 admissions in PICU and found mortality rate12.9%. Most common cause of death was limitation of life sustaining. Treatment followed by failed cardiopulmonary resuscitation[3] Sashikala et al in their study of 990 patients found

mortality rate of 23.5 %, 72% deaths were below 5 years of age[4].This could be due to infections specially like malaria, dengue (mosquito born diseases) are more prevalent during the rainy season. Mortality was also reported maximally in the month of September followed by August. The reason could be due to the cases came with complicated common infections complicated with MODS prevalent in this catchment area. Khilani P et al in their study found causes of admissions as respiratory (19.7%), Neurological (17.9%), infections (12.5%), cardiac (9.7%), trauma (11.7%), other surgical (8.8%) and overall mortality (6.7%) [5].George et al studied 2174 admissions in PICU and reported death rrate 2.8%. 80.3% mortalitybelonged to less than 5 years of age[6].Recently study done by Rukmani and Kumar observed as Respiratory followed by infections were the commonest indications of admissions in PICU[7].A study by Kalaria A et al, CNS diseases were the commonest cause of mortality and followed by respiratory system diseases.[8]. Vaiable pattern of mortality have been seen by different researchers.[10],[11],[12].Out data appears close to other researchers specially as most common cause of admissions and mortality were due to infections. With regard to mortailty there are variable results, probably due to differences in infrastructure, resources, skilled professionals involved in management and policy and protocol.

Conclusions

Infections and central nervous system diseases were the predominant conditions leading to PICU admissions in our hospital. Many of these conditions are vaccine preventable. This study highlights the importance of management of critically sick children and recommends for further augmenting and expanding the coverage o f immunization specially in rural areas.

Limitations: Surgical cases after initial stabilization shifted to pediatric surgery ward were not followed.

Details of clinical conditions in particular system or groups were not mentioned in our study.

References

[1]. Ministery of health and family welfare – National family health survey – (4), 2015-2016. available at : mohfw.nic.in

[2]. Kapil D, Bagga A. The profile and outcome of patients admitted to a pediatric intensive care unit. Indian J Peditr 1993; 60:5-10.

[3]. Siddiqui Nu, Ashraf Z, Jurair H, Haque A. Mortality patterns among critically ill children in a Pediatric Intensive Care Unit of a developing country. Indian J Crit Care Med. 2015; 19:147-50.

[4]. Shashikala V, Begum A, Kumar C S. Analysis of Mortality in PICU of A Tertiary Care Teaching Hospital in Telangana. Journal of Dental and Medical Sciences. 2016; 15(5):07-20.

[5]. Khilnani P, Sarma D, Singh. Demographic profile and outcome analysis of tertiary level Pediatric Intensive Care Unit. Indian J Paediatr 2004;71:587-91.

[6]. George I O, Hart B A Alex, Briggs A I Frank-Mortality Pattern in Children. A Hospital Based Study in Nigeria: Int J Biomed Sci. 2009; 5(4):369-72. PMC3614794.

[7]. Rukmani J, Kumar N. Clinical profile and outcome of PICU in a tertiary care hospital in South India. R A Journal of Applied Research 2017;3(5):902-7.

[8]. Kalaria A, Kapoor A, Singh R. Mortality pattern in pediatric intensive care unit patients of a tertiary care teaching hospital. 2016;3(12)

[9]. Bryce J et al. WHO Child Health Epidemiology Reference Group: WHO estimates of the causes of death in children? Lancet 2005; 365:1147-52.

[10]. Haque A, Bano S. Improving outcome in pediatric intensive care unit in academic hospital in Pakistan. Pakistan J Med Sci 2009; 25:605-8.

[11]. Singhal D, Kumar N, PuliylbJM, Singh SK, Srinivas V. Prediction of mortality by application of PRISM score in intensive care unit. Indian Pediatr 2001;38:714-9.

[12]. Mukhija, Chandra S ,Prasad PL. Clinical profile of patients admitted to the PICU of a tertiary care teaching hospital. Int J. Ped Research 2017;4(02):127-129.