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ORIGINAL ARTICLE

Clinical Profile and Outcome of Critically Ill Children in Tertiary Care Hospital

Taruna Vijaywargiya*, Astha Pandey

Department of Pediatrics, Vivekananda Polyclinic and Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

Abstract

Introduction: The aim is to study the clinical profile and outcome of critically ill patients admitted to Pediatric Intensive Care Unit (PICU).

Method: This was a retrospective study of the demography, clinical profile and outcome of PICU patients admitted over a period of 1 year from January 2022 to December 2022.

Result: Total 213 patients were admitted, with males and females 66.7% and 33.3%, respectively. 62% of the patients were below 5 years of age. Most common presentation was primary neurological abnormalities 22.1% followed by primary respiratory abnormality 20.2%. The majority of patients 79.9% improved and discharged, 3.8% expired, 13.2% were referred after stabilization, and 3.3% left against medical advice.

Conclusion: A most common cause of admission in PICU is primary neurological abnormalities followed by respiratory.

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***Correspondence:**
Taruna Vijaywargiya
tarunavijay09@gmail.com

Department of Pediatrics, Vivekananda Polyclinic and Institute of Medical Sciences, Lucknow, UP, India

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Introduction

The management of critical illness in the children is constantly advancing with growth in pediatric emergency and Intensive Care Management as well as technological advancements in pediatrics. Still the care of critically ill children in intensive care is one of the most demanding and challenging aspect in the field of pediatrics. Mortality and morbidity rates in infants and children have been considerably lower in the past decade due to enhanced monitoring, treatment, emergency care, intensive care and technological advancement[1,2,3,4]. Reported mortality in PICU varied widely in different countries, ranging from 2.1% to 35% in different studies.[5-10] Guidelines of interventional methods, sophisticated techniques and management have been proposed by various organizations including World Health Organisation and American Association of Paediatrics to decrease the morbidity and mortality of critically ill children. As the prevalence of critical illness differs in different regions so it is very important to have knowledge of the clinical profile of critically ill children as it helps in developing the facilities and preparing treatment protocols accordingly. In the present study, primary objective is to study the clinical profile and outcome of sick children admitted in PICU.

Methodology

The study was carried out in tertiary care, super specialty, charitable hospital in north India. The hospital has a well- equipped four bedded PICU, which admits medical and surgical subspecialties sick pediatric patients upto16 years of age. This was a retrospective record-based study; one year data collection (January 2022 to December 2022) of sick children admitted to Pediatric Intensive Care Unit (PICU) aged 1-month to 16 years of age was done. The patients who expired or left against medical advice within 24 hours of admission were excluded. Data collected was done on patients included age, gender, diagnosis, duration of stay in PICU, need of mechanical ventilation, and outcome (discharges, left against medical advice (LAMA), referred. and expired). All patients were investigated and treated as per standard protocols. The institutional ethical committee waived off ethical clearance as patient identity was not disclosed in the study.

Result

Total 218 patients were admitted during the study period out of which 5 were excluded as per exclusion criteria. A total of 213 patient records; aged 1-month to 16 years were evaluated. Most of the patients belonged to the age group of 1-month to 1-year (38.97%) followed by age group of 1-5 years (24.9%), and only 8.4% were aged ≥10 years. 66.7% (n=142) were males, while 33.3% (n=71) were females. 70.4% (n=150) were from rural areas (Table 1).

The most common presentation was primary neurological abnormalities in 22.1% followed by

Table 1: Sociodemographic data of patients

Finding	Number	%
Age		
<1year	83	38.97
1–5 year	53	24.9
5–10 year	59	27.7
>10 year	18	8.4
Gender		
Male	142	66.6
Female	71	33.3
Residents		
Rural	150	70.4
Urban	63	29.6

Table 2: Distribution of patients as per primary system involvement

Primary system involvement	Number	%
Neurological	47	22.1
Respiratory	43	20.2
Infectious disease	29	13.6
Cardiovascular	11	5.2
Gastrointestinal / liver	12	5.6
Hematological	10	4.7
Renal	13	6.1
Surgical	40	18.8
Others	8	3.8

Table 3. Clinical diagnosis of patients

Diagnosis	Number	%
Complicated Pneumonia	23	10.8
Acute Bronchiolitis	12	5.6
Foreign body	3	1.4
Acute exacerbation asthma	5	2.4
Acute encephalitis syndrome	15	7.0
Acute pyogenic meningitis	13	6.1
Seizure disorder	9	4.20.5
Space occupying lesion	2	1
Guillain barre syndrome	5	2.4
Stroke	3	1.4
Acute liver failure	6	2.8
Severe pancreatitis	4	1.9
Severe dehydration	10	4.7
EHPVO	2	1
Leukemia	4	1.9
ITP	3	1.4
TTP	1	0.5
Aplastic anemia	2	1
Myocarditis	4	1.9
Cyanotic spell	3	1.4
Severe anemia with CCF	4	1.9
Diabetic ketoacidosis	3	1.4
Acute kidney injury	5	2.4
Nephrotic syndrome complication	2	1
CKD with complications	6	2.8
Inborn error of metabolism	2	1
Severe dengue with shock	16	7.5
AGE with Severe dehydration	10	4.7
Complicated malaria	3	1.4
Poisoning	3	1.4
Surgical	40	18.8

Table 4: Outcome of patients

Outcome	Number	%
Discharged	170	79.9
Expired	8	3.8
LAMA	7	3.3
Referred	28	13.2

primary respiratory abnormality in 20.2%. (Table 2) Common neurological illnesses included acute Encephalitis syndrome (n = 15, 32%) followed by acute pyogenic meningitis (n = 13, 27.7%) and seizure disorder (n = 9, 19.1%) requiring PICU care. In respiratory illnesses complicated pneumonia(n = 23, 53.4%) followed by acute bronchiolitis(n = 12, 27.9%) and acute exacerbation of asthma(n = 5, 11.6%) were common. In gastrointestinal illnesses, severe acute liver failure (n=6, 50%) was the commonest cause of PICU admission. Apart from these, many other conditions requiring PICU care were managed including poisoning, an inborn error of metabolism, DKA, myocarditis etc. (table 3) 25.3% cases required mechanical ventilation. Mean Duration of PICU stay was 4.34 ± 3.13 days.

Majority of patients 79.9% improved and discharged, 3.8% expired, 13.2% were referred after stabilization (including leukemia, aplastic anemia, complex cardiac disease, etc.) while 3.3% left against medical advice. (Table 4).

Discussion

With the advancement in pediatric critical care medicine survival of sick children has improved. Many diseases which were previously fatal in pediatric patients are now treatable due to advancements in diagnostic and management strategies. During 1-year period 213 patients were admitted to 4 bedded tertiary care PICU, which is comparable to other tertiary care PICUs in the country.[11,12] Majority of patients admitted to PICU were males (66.6%), similar to that observed by Shah *et al.*[8] and Sahoo *et al.*[11] 38.97% of admitted patients were infants, in line with the finding of Haque and Bano.[9]

Even though the incidence of meningitis and encephalitis in children is declining as a result of vaccination, but still community-acquired bacterial meningitis is related to high neurological mortality and morbidity. In our study, neurological disorders (22.1%) were the most common cause of PICU admission which included encephalitis syndrome (31.9%), meningitis (27.6%) and seizure disorder (19.14%); followed by respiratory disorders (20.2%) which included complicated pneumonia (53.5%), acute bronchiolitis (27.9%) and acute severe exacerbation of asthma (11.6%). Shah *et al.* reported respiratory illness (33%), Haque A found post-cardiac surgery (34%), Blessing I reported cardiovascular disease (41.1%) while Sahoo B et al found infectious diseases (20.7%) and respiratory diseases (19.1%) as major causes of admission into the PICU.[8-11] It shows that PICU admissions vary in different regions so one should have knowledge of prevalent conditions so as to develop the management facilities and treatment protocols accordingly.

Overall mortality in this study was 3.8%, and reported mortality varied from 4.6-35% in different studies.[11-15] It is more than the mortality rate documented by Shah *et al.* (2.1%), Sahoo B *et al.* and Choi *et al.* (2.6%).[8,11,14] However, it is less than the mortality recorded by Khilnani *et al.* and Bellad *et al.* 6.7% and 16.7%, respectively.[12,13]

The average length of stay (4.34 ± 3.13 days) in PICU of our study is similar to mean duration of stay 4.52 ± 2.6 days as reported by Khilnani *et al.*,[12] while Sahoo *et al.*[11] reported 3.7 ± 2.5 days.

Conclusion

We concluded that the majority of the patients in our PICU are children below 5 years with male preponderance. Central nervous system disorders including AES, status epilepticus, and meningitis were the commonest cause of admission in our PICU, followed by respiratory diseases including acute bronchiolitis, complicated pneumonia, and acute asthma exacerbation.

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