

ANALYSIS OF PATIENTS PRESENTING TO THE PAEDIATRIC INTENSIVE CARE
UNIT (PICU) OF A TERTIARY CARE HOSPITALAnzeen Nazir Kanth¹, Aymen Masood Khan², Dr. Suhail Masood Khan^{3*}, Azhar Ajaz Khan⁴ and
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Article Received on 18/11/2021

Article Revised on 08/12/2021

Article Accepted on 28/12/2021

ABSTRACT

Introduction: Paediatric intensive care has become more crucial in the treatment of severely sick children who require advanced airway, respiratory, and hemodynamic support in order to improve their chances of survival. **Materials and Methods:** Over the course of a year, from March to December 2020, retrospective research was conducted on children aged more than 28 days to 12 years who were admitted to a paediatric intensive care unit (PICU) of a tertiary care teaching hospital in North India. All admissions records were scrutinised. In Microsoft Excel, the results are tallied. **Results:** 360 (74.34 percent) of the 481 youngsters admitted survived. There were 309 men (64.24 percent) and 172 women (35.76 percent). The age group > 28 days to 12 months had the highest number of patients hospitalised (n=170, 35.34 percent >), as well as the highest mortality rate (n=51, 43.59 percent >). The death rate for children under the age of five was 83 percent (64.51 percent >). (Including 43.59 percent of infant mortality and excluding neonates). 63 (46.32 percent) of the 136 (37.78 percent) patients who required mechanical ventilation were successfully recovered. The central nervous system (n=128, 26.61 percent >), respiratory (n=112, 23.28 percent >), and gastrointestinal (n=63, 13.1 percent >) were the three most prevalent illness categories requiring hospitalisation. **Conclusions:** In order to estimate the overall outcomes of critically sick children in India, further research is needed. The results of an epidemiologic analysis of these patients may help to re-allocate resources and enhance the outcome.

KEYWORDS: PICU, critical care, urology.

INTRODUCTION

Intensive care has grown more significant in the management of critically sick patients since the first intensive care units (ICUs) were developed in the United States in the 1960s. To enhance outcomes, paediatric patients who are severely sick and require advanced airway, respiratory, and hemodynamic support are admitted to the Paediatric Intensive Care Unit (PICU). Patients who have a potentially reversible disease and a fair probability of survival with intensive care assistance are provided intensive care. The goal of paediatric critical care is to reduce mortality and return a child in a life-threatening condition to health with the least amount of pain, worry, and problems possible.^[1] This, however, comes at a significant expense to all parties concerned, including the hospital, workers, and patient care providers. The outcomes of these patients may be used to analyse and measure treatment efficacy, allowing better decisions to be made to guarantee effective management

of high-level resources and optimal resource usage. As a result, the purpose of this study is to examine the pattern of patients admitted to our PICU and their outcomes. The term "audit" here refers to a methodical strategy to revealing potential for improvement and positive change in clinical practise, as well as a professional dedication to improvement.^[2]

METHODS

This was a one-year retrospective record-based research that took place in children hospitalised to a teaching hospital's paediatric intensive care unit (PICU) in North India from March 1 to December 2020. The institutional ethics committee gave its approval. This is a reference hospital for tertiary care and super specialties. The hospital's well-equipped 8-bed PICU meets the critical care needs of in-patients from Paediatric Medicine as well as other departments such as Paediatric Surgery, Entorhinal- laryngology, Neurosurgery, and

Orthopaedics. All hospitalised patients with a PICU admission age of > 28 days to 12 years had their data examined and analysed. Details on age, gender, diagnostic spectrum, and prognosis were gleaned from medical records and hospital records, then collated and analysed in Microsoft Excel (Microsoft Office2016). Survived, left against medical advice (LAMA), and death were the three outcomes.

RESULTS

Between January and December 2017, 481 patients were admitted to the PICU. There were 309 men (64.24 percent) and 172 women (35.76 percent) among them. The ratio of males to females was 1.8:1. The age distribution and destiny of the admitted children are shown in Table 1.

Table 1: Distribution according to age.

Age	No of patients admitted	Patients Survived	Patients died
>28 days-12 months	170(35.34%)	119(56.41%)	51(43.59%)
13-59 months	153(31.81%)	120(78.43%)	32(20.92%)
60-120 months	118(24.53%)	84(73.50%)	31(26.5%)
>120 months	40(8.32%)	37(97.44%)	3(2.56%)
Total	481	360	117

The age group > 28 days to 12 months had the highest number of hospitalised cases (n=170, 35.34 percent). The age group 13-59 months came in second (n=153,31.81 percent). In decreasing order, the age groups 60-120 months (n=118, 24.53 percent) and >120 months (n=40,

8.32 percent) were studied. Children under the age of five made up 67.15 percent of the cases (n=323). Table 2 shows the system-level causes of PICU admission and their link to the outcome.

Table 2: Morbidity and mortality pattern in total admission according to system involved/causes.

Diagnosis	No. of patients admitted	Survived	Died
Neurological	128(26.61%)	100(78.13%)	26(22.22%)
Respiratory	112(23.28%)	74(66.07%)	36(30.77%)
Cardiovascular	46(9.56%)	31(67.39%)	15(12.82%)
Renal	59(12.27%)	43(72.88%)	16(13.68%)
Gastrointestinal	63(13.1%)	57(90.48%)	6(5.13%)
Sepsis /Infection	39(8.11%)	24(61.54%)	15(12.82%)
Haematological	14(2.91%)	11(78.57%)	3(2.56%)
Endocrinal	7(1.46%)	7(100%)	0
Miscellaneous	13(2.7%)	13(100%)	0
Total	481	360	117

In this study, the central nervous system (n=128, 26.61 percent), respiratory (n=112, 23.28 percent), and gastrointestinal (n=63, 13.1%) were the three most prevalent illness categories admitted. Renal (n=59,12.27 percent), cardiovascular (n=46,9.56 percent), sepsis (n=39,8.11 percent), haematological (n=14,2.91 percent), miscellaneous (n=13,2.7 percent), and endocrine (including patients with diabetic ketoacidosis) (n=7,1.46 percent) were the other most prevalent reasons for hospitalizations. Poisoning, drowning, and people with orthopaedic problems are some of the other causes (including limb trauma). The average time spent in the PICU was 5.86 days (with a range of 24 hours to 120 days). 136 (37.78%) of hospitalised patients requiring mechanical ventilation, with 63 (46.32%) of ventilated patients recovering satisfactorily. Table 3 displays the admissions' overall outcome, whereas tables 1 and 2 indicate the admissions' age and system specific outcomes, respectively. A total of 360 (74.34 percent) of the 481 youngsters admitted survived, while 117 (24.31 percent) perished. The age group >28days -12 months had the highest death rate (n=51,43.59 percent), followed

by the age groups 13-59 months (n=32, 20.92 percent), 60-120 months (n=31,26.5 percent), and >120 months (n=3, 2.56 percent). The death rate for children under the age of five was 64.51 percent (n=83) (including 43.59 percent infant mortality and excluding neonates). Patients hospitalised with respiratory system involvement (n=36, 30.77 percent) had the highest rate of death, followed by patients with neurological system involvement (n=26, 22.22 percent). Patients with cardiovascular, renal, and septic complications had mortality rates of 12.82 percent, 13.68 percent, and 2.82 percent, respectively.

Table 3: Outcome of patients in PICU.

Outcome	No of cases	Percentage (%)
Survived	360	78.84
Expired	117	24.32
LAMA	4	0.83
Total	481	100

DISCUSSION

The PICU is a specialised health-care delivery unit for critically ill patients with possibly curable disorders. To treat and enhance the survival of critically ill patients, PICU involves extensive use of up-to-date equipment and highly qualified employees, as well as a significant amount of time and effort on the part of the medical and nursing staff. To achieve a low death rate, protocol-based treatment, a sensible antibiotic strategy, and early referral to the PICU must be implemented. During the time of the trial, 481 children were hospitalised to the PICU. There were 309 men (64.24 percent) and 172 women (35.76 percent) among them. The ratio of males to females was 1.8:1. Khilnani et al.³ discovered a male: female ratio of 2.95:1 and I. Blessings Abhulimhen - Iyoha et al. found a male: female ratio of 1.49:1.⁴ Anwarul Haque et al.⁵ reported that the majority of patients (60.9 percent) were male in another research published in Pakistan. In this study, children under the age of five made up 67.15 percent of admissions (n=323), with babies accounting for 35.34 percent (n=170) (excluding neonates). I. Blessing Abhulimhen - Iyoha et al.⁴ found that 72.4 percent of patients were under the age of 5 years (including 50.7 percent of babies), whereas Anwarul Haque et al. found that 62.5 percent of patients were under the age of 5. The number of children admitted to a paediatric critical care unit varies depending on the study. In this study, the central nervous system (26.61 percent), respiratory (23.28 percent), and gastrointestinal (13.1 percent) were the three most prevalent illness categories admitted. Anwarul Haque et al.⁵ found that the most prevalent reason for hospitalisation was neurological (28%) followed by respiratory (24.4%), while research by I Das⁶ found that neurological was the most common reason for admission (30.51%) and respiratory was 19.37 percent. I. Blessing Abhulimhen - In their study, Iyoha et al.⁴ found that cardiovascular illness was the most prevalent reason for hospitalisation (41.1%), whereas Khilnani et al.³ found that respiratory disease was the most common reason for admission (19.7%), followed by neurological disease (17.9%).

In this study, the overall mortality rate was 24.32 percent. With the gross mortality rate, this number is larger than that reported by Khilnani et al. (3). (6.7 percent). Anwarul Haque et al. reported a 14 percent overall death rate in their PICU. Blessings Abhulimhen - Iyoha et al. (4) discovered that mortality was as low as 2.1 percent in their centre. Patients' mortality is determined by a variety of factors, including demographic and clinical characteristics of the population, infrastructure, non-medical factors (administration and organisation, time to get health care), admission practise, and ICU performance.^[6]

Several variables may have contributed to the increased fatality rate in our research. The central nervous system was responsible for 26.61 percent of admissions in our PICU, and majority of these patients were Acute Encephalitic Syndrome, such as viral

meningoencephalitis and Japanese B Encephalitis, both of which have a poor prognosis. Another factor contributing to increased mortality is that many patients who require PICU admission must first be handled on the ward due to a lack of PICU beds, and then transferred to PICU later in the illness process.

CONCLUSIONS

The current study identifies neurological, respiratory, and gastrointestinal disorders as the most common reasons for admission to the PICU, which serves the critical care needs of in-patients from Paediatric Medicine as well as in-patients of paediatric age from other specialties and super specialties. As a result, the purpose of this study is to examine the pattern of patients admitted to the PICU of this tertiary care teaching hospital and their outcomes.

More well-planned, systematic, and large-scale studies in this field are needed, using standardised methodologies, to estimate the leading causes of admission, morbidity, and mortality in the PICU, with representation from various regions of India, in order to provide effective PICU care in reducing the mortality and morbidity of critically ill patients, resulting in the desired outcome.

DECLARATIONS

We hereby declare that

Funding: There was no funding involved as it was an observational study.

Conflict of interest: There is no Conflict of interest.

Ethical approval: Ethical Clearance approved by the institutional ethical committee.

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