



## Clinical Profile of Children Admitted to a Pediatric Intensive Care Unit

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### Abstract

**Introduction:** Care of the critically ill paediatric patients is a demanding speciality needing expertise in care, understanding various cases presenting in such set ups and requires huge resources and finances. **Objective:** This study aimed to analyze the etiologies of PICU admission of pediatric critically ill patients presenting to the pediatric intensive care unit (PICU).

**Materials and Methods:** This descriptive study included children aged 1-12 years presenting with critical illnesses to the PICU and was conducted in a government medical college and Hospital, in Bihar, from 2016 to 2017. All patients transferred to the PICU were included without distinction. Demographic data of critically ill children admitted to the PICU were analyzed. Etiologies of the PICU admissions were also assessed.

**Results:** There were 184 critically ill children admitted to the PICU. Neurological disorders comprised major group of primary diagnosis, 84 (52.2%) children had neurological diagnosis. 22 (12%) children had infectious disease, 18 (9.8%) subjects had respiratory diseases, 16 (8.7%) subjects had gastrointestinal diseases, 8 (4.3%) children had Cardiovascular illness, 14 (7.6%) children had accidental causes, 10 children had endocrinal disorder.

**Conclusion:** The present study shows the etiologies of pediatric patients admitted to ICUs. The epidemiologic analysis of patients admitted to PICU can serve as basis for developing dedicated protocols for critical care and redistributing the ICUs' resources.

**Keywords:** Critical illness, paediatric intensive care unit, neurological diseases.

### Introduction

The development of specialized pediatric intensive care units (PICUs) has contributed to the improved survival of critically ill children. In the past two decades, improvements in life sustaining technologies in PICU care has resulted in an increase in the number of PICUs.<sup>1</sup> But care of the critically ill patients is resource-intensive, and

because of the high cost of healthcare. In an era, which focuses upon rationalization and optimization of health care resources, evaluation of long term outcome is fundamental in evaluating the effectiveness of intensive care.<sup>2</sup> Studying the clinical profile of patients in pediatric intensive care is necessary to equate the high cost of treatment with benefit to the patients.<sup>3,4</sup>

Epidemiologic analysis of patients admitted to PICU can serve as basis for developing dedicated protocols for critical care and redistributing the ICUs' resources.<sup>5,6</sup> The aim of this study was to explore a profile for paediatric patients admitted to PICU of a government medical college to identify the magnitude of each illnesses that needed intensive care and hence this might help in redistribution of resources and qualified manpower training.

## Methods

A cross sectional study was conducted in PICU follow up clinic of a teaching and referral hospital in eastern India over 1 year (Dec 2017 to Nov 2017). PICU is 6 Bedded, tertiary level at Patna Medical College and hospital, Patna. ICU readmission and infants were excluded from the study.

Data was collected in respect to demographics, indications of PICU admission, primary diagnosis, severity of illness, co morbidities, length of ICU stay (days) and nosocomial sepsis. Admissions to the ICU were classified into one of seven diagnostic groups: neurological, respiratory, infectious diseases, accident/trauma, cardiovascular, gastrointestinal (GI) disease and endocrine diseases.

## Statistical analysis

Descriptive statistics was used. SPSS version 16 was used for analysis.

## Results

There were total 184 children were enrolled in study from PICU during study period, who fulfilled inclusion criteria.

**Table 1:** Break up of primary diagnosis groups

	Frequency	Percent
Neurological disorders	84	52.2%
Infectious disease	22	12%
Respiratory disease	18	9.8%
Gastrointestinal disease	16	8.7%
Cardiovascular disease	8	4.3%
Accidental disease	14	7.6%
Endocrinal disorders	10	5.4%

There were 184 critically ill children admitted to the PICU whose mean  $\pm$ SD age was 4.9  $\pm$  3.3 (range 1- 12) years with 144 (78%) of them boys. The mean duration of PICU stay was 13.8  $\pm$  17.9 (range 2- 120) days. Admissions to ICU were classified into one of seven diagnostic groups. Neurological disorders comprised major group of primary diagnosis, 84 (52.2%) children had neurological diagnosis. 22 (12%) children had infectious disease, 18 (9.8%) subjects had respiratory diseases, 16 (8.7%) subjects had gastrointestinal diseases, 8 (4.3%) children had Cardiovascular illness, 14 (7.6%) children had accidental causes, 10 children had endocrinal disorder.

Co morbidities were present in 18 (19.6%) children at the time of admission; these were anemia, hemiparesis, gastro esophageal reflux, diabetes mellitus, post cardiac arrest, hemophilia, and cerebral palsy.

## Discussion

Critically ill infants, children, and adolescents up to age 12 years receive constant care, sophisticated monitoring, and specialized therapies in the PICU set up at the centre of study. We noticed that children younger than 5 years of age were the vulnerable age group representing the majority of admitted patients to PICU. In this study, 53% of patients stayed an about 10-14 days. We observed a male preponderance in our PICU admissions. A similar trend was observed in two other Indian studies, where 69.2% and 66.7% of admissions were boys respectively.<sup>1,2,5</sup> This possibly is a reflection of the social bias favouring boys which is prevalent in this part of India.

Nearly half of our study patients had neurological illnesses (52%), followed by infectious (12%), respiratory (9.8%), gastrointestinal (8%), and Cardiovascular (4.3%). This is in contrast, to previous Indian studies<sup>2,4</sup> wherein respiratory illnesses (19.7%) were more common than neurological illnesses (18%). Co morbidities were present in nearly one-fifth of our cohort at admission as in other studies.<sup>7</sup> This was similar to

a study done in past which found 31% of children had pre-existing health care problems.<sup>8,9</sup>

### Limitations

The major limitation of our study is the exclusion of infants who represent a sizeable portion of ICU admissions. Future studies including infants and a larger sample size should be planned. Also outcome of these patients needs to be addressed in order to better care the clinical scenario unfolded by current study.

### Conclusions

Epidemiologic study of the patients admitted to PICU shows variable etiologies for admission; the most common was neurological system diseases. New protocols have to be provided to care givers in light of the current study findings and accordingly PICU infrastructures have to be updated for this clinical group.

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