

## Original Research Article

# Demographic profile and outcome analysis in paediatric intensive care unit at tertiary care hospital in the sub-Himalayan region

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## ABSTRACT

**Background:** Care of critically ill children continues to be one of the most challenging aspects of the field of paediatrics. Our study therefore, was done to see the demographic and morbidity pattern of the disease at a tertiary care hospital in the Sub Himalayan region and also the modifications that can lead to better outcomes.

**Methods:** This was a retrospective record-based study which reviewed the admissions in to the PICU of tertiary care centre in the Sub Himalayan region of North Bengal for a period of 2 years (April 2018 to April 2020) with age group more than one month to twelve years of age from both medical and surgical sub-specialties. Data collected in pre-designed pro forma. Descriptive study analysis was done.

**Results:** Out of the total 776 cases analysed 59% were male. LRTI comprised of maximum percentage of cases 27.8%, followed by sepsis (21.6%) and meningo encephalitis (16.7%). A maximum of 39% stayed for 3-7days in PICU, and 29.9% expired. Out of the total deaths, meningo encephalitis was responsible for maximum (27.6%).

**Conclusions:** Our study is the first of its kind depicting the the demographic and morbidity patterns of the disease at a PICU in a tertiary care hospital in the Sub Himalayan region. Outcome analysis showed that PICU mortality rate was higher than in relevant recent studies.

**Keywords:** Demography, Pediatric intensive care, Mortality, Meningo encephalitis

## INTRODUCTION

Care of critically ill children continues to be one of the most challenging aspects of the field of paediatrics. Although there are many studies documenting outcomes of Paediatric Intensive Care Units (PICU) from western countries but there is dearth of data that are available from the developing countries.<sup>1-6</sup> All Previous studies have shown significant positive impact of Intensive care on the outcome in children. However not much data is available from the Sub Himalayan region. Our study therefore, was done to see the demographic and morbidity pattern of the disease at a tertiary care hospital in the Sub Himalayan region and also the modifications that can lead to better outcomes.

## METHODS

This was a retrospective record-based study which reviewed the admissions in to the PICU of tertiary care centre in the Sub Himalayan region of North Bengal for a period of 2 years (April 2018 to April 2020).

Inclusion criteria included all patients that were admitted in the PICU from both medical and surgical sub-specialties, age between 1month up to 12 years of age.

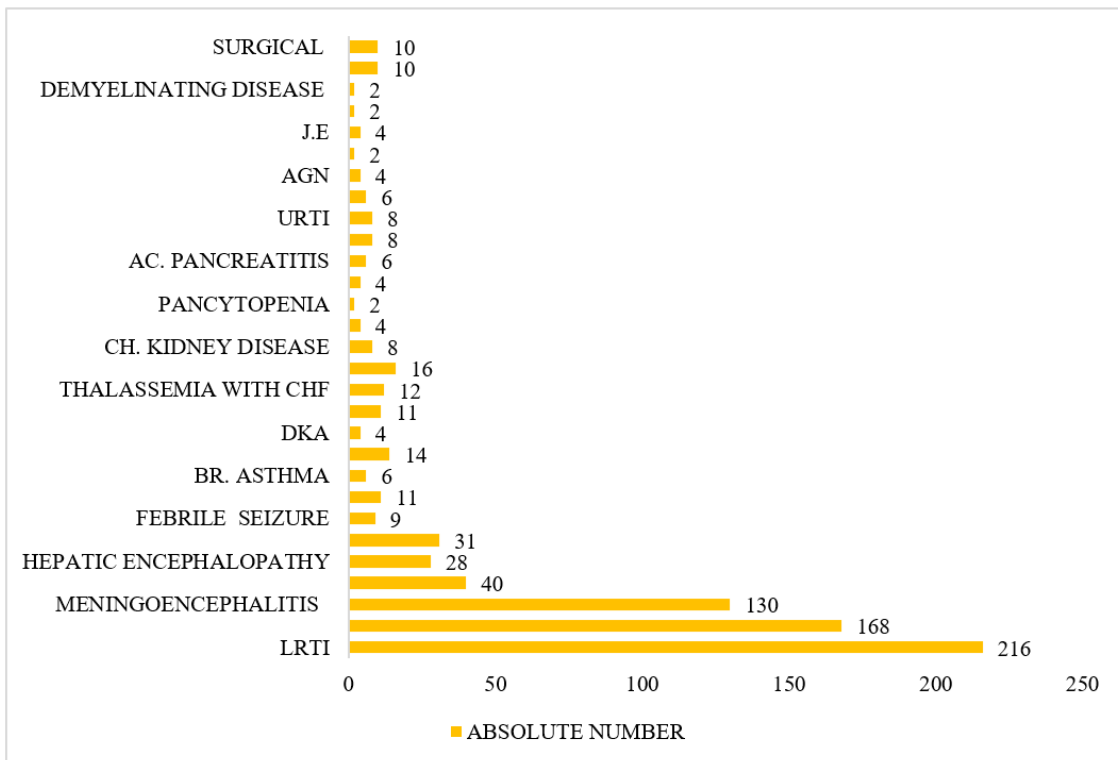
All patients admitted were treated according to the written standard PICU protocol of the institute. Data were collected on the basis of age, gender, diagnosis and duration of stay in PICU in pre-designed pro-forma by the Pediatric residents working in the PICU under the

supervision of the faculty. Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Data was thereafter summarized by routine descriptive statistics, namely mean and standard deviation for numerical variables and counts and percentages for categorical variables. Ethical permission has been sought from the institutional ethics committee.

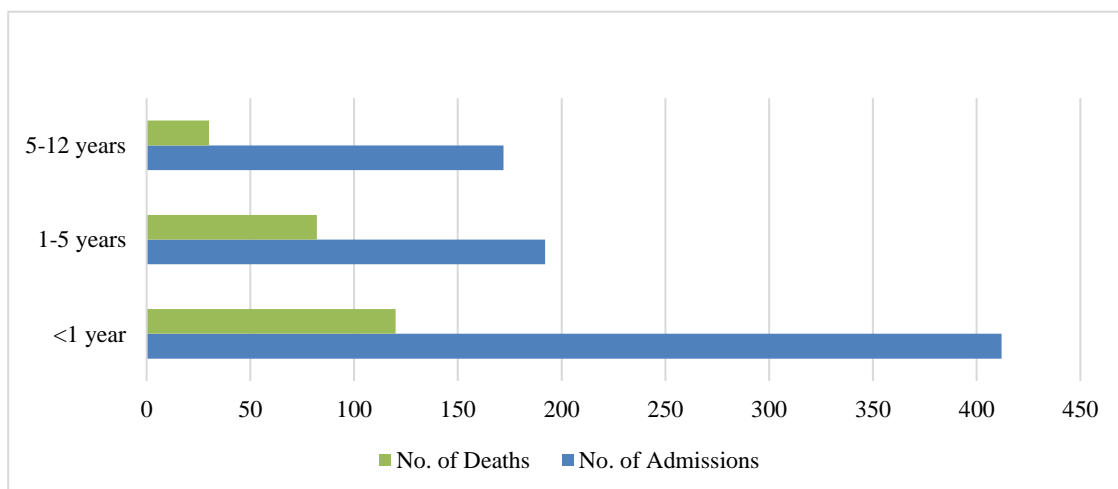
**RESULTS**

A total of 776 patients were admitted to the PICU during this period with male and female children being 59% and 41% respectively. Diagnosis included neurological

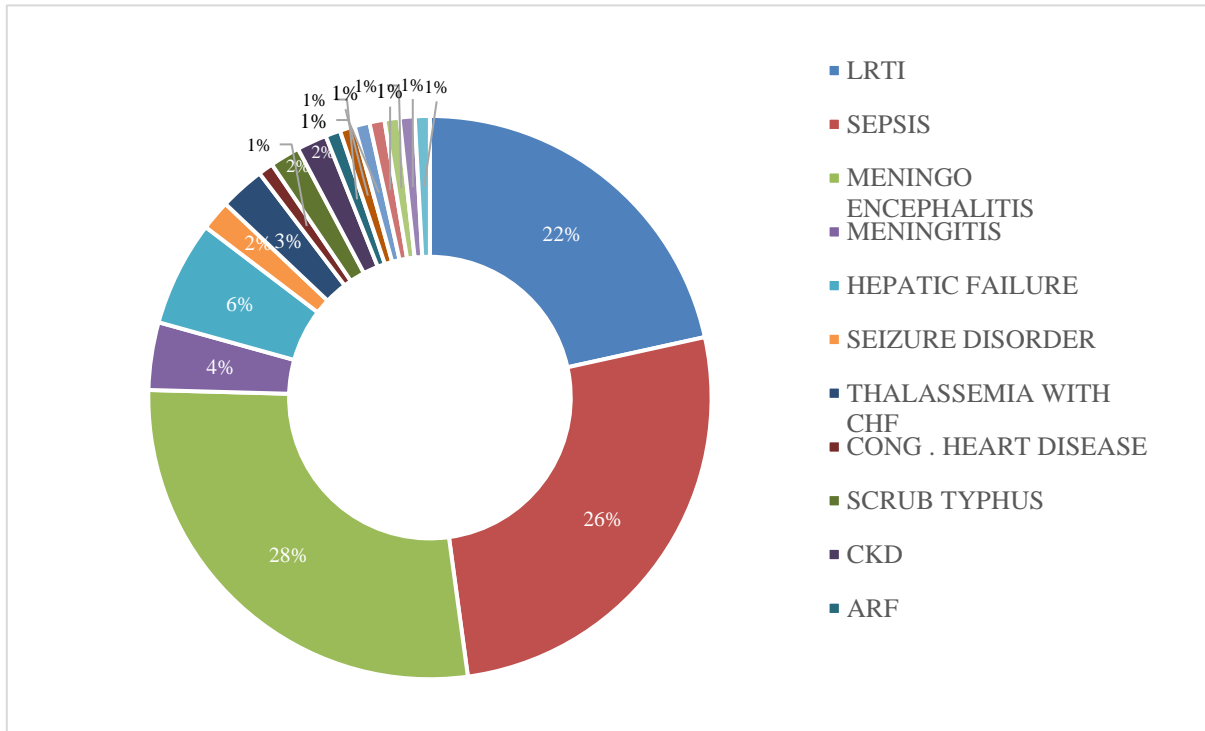
diseases (seizures disorder, meningoencephalitis, meningitis), infectious diseases (sepsis, acute gastroenteritis with severe dehydration), respiratory diseases (lower respiratory tract infections, pneumonia, bronchiolitis, severe asthma), gastrointestinal (acute liver failure, hepatic encephalopathy), haematological (pancytopenia), renal (acute kidney injury), cardiovascular (congestive heart failure, congenital heart diseases), diabetic keto acidosis & others. LRTI comprised of maximum percentage of cases 27.8%, followed by sepsis 21.6% and meningo encephalitis and meningitis comprised of 16.7% and 5.2% cases respectively depicted in Figure 1.



**Figure 1: Distribution of the absolute number of admissions as per disease type.**



**Figure 2: Distribution of admissions and death according to age.**



**Figure 3: Distribution of deaths according to different diseases.**

The duration of stay in PICU varied as 27.6% stayed for less than 2days in PICU, while 39% stayed for 3-7days, and 33.4% stayed for more than 7days. Majority 392 (50.5%) were shifted to ward while 232 (29.9%) expired. Age wise distribution of patients and deaths are depicted in Figure 2 which shows that the majority of admissions as well as deaths involved infants.

Thirty five (4.5%) were directly discharged from the PICU. Among the deaths, the major cause was meningo encephalitis, responsible for 64 deaths (27.6%), followed by sepsis (26.3%) and LRTI (22.6%) shown in Figure 3.

## DISCUSSION

Our study is the first of its kind from the Sub Himalayan region. Our tertiary care hospital caters to a population spanning across the North Eastern states and even countries like Nepal, Bangladesh and Bhutan.

In a study, conducted by Praveen Khilnani et al with 948 children admitted to PICU, they found that the mean age was 41.48 months and male to female ratio was 2.95:1. Diagnoses included respiratory (19.7%), cardiac (9.7%), neurological (17.9%), infectious (12.5%), trauma (11.7%), other surgical (8.8%) and 49.5% of non survivors had multi-organ failure. The average length of PICU stay was  $4.52 \pm 2.6$  days.<sup>7</sup> In comparison our study also showed that the majority of cases were LRTI s and most of the patients had an average stay of 3-7days.

Another study from Pakistan, showed 37% were less than one-year-old and 66% was male. They had almost equal

distribution of medical (46%) and surgical (54%) cases. The average length of PICU stay for them was 3.2 (1-49) days, while the overall mortality rate was 14%.<sup>8</sup> Our study had a higher mortality comparatively (29.9%), which may be attributed to delayed referrals and nature of the disease.

Most common cause of death in our set up was due to meningo encephalitis. Meningo encephalitis continues to be a significant cause of mortality in children till date.<sup>9,10</sup> Farzana et al in their study in Uttar Pradesh describes mortality of 50% while another study from West Bengal describes a similar higher mortality.<sup>11,12</sup> In comparison 27.6% deaths were due to meningo encephalitis.

Limitations of our study include that we were not able to follow up the children after discharge regarding their long term morbidity.

## CONCLUSION

Our study is the first of its kind depicting the the demographic and morbidity patterns of the disease at a PICU in a tertiary care hospital in the Sub Himalayan region. The demographic profile of our patients showed that although age, sex, and duration of PICU stay follow the general pattern of PICU patients worldwide, there are major differences in disease patterns.

Meningoencephalitis contributed to a major portion of mortality probably due to the endemic nature of the disease in the province. Outcome analysis showed that PICU mortality rate was higher than in relevant recent

studies. Thus, emphasising on the importance of timely referral and the need for more such set ups in the region.

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