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MORTALITY PATTERN OF CHILDREN ADMITTED IN PAEDIATRIC INTENSIVE CARE UNIT (PICU) IN TERTIARY CARE HOSPITAL

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A B S T R A C T

Background: A well functioning Pediatric Intensive Care Unit (PICU) contributes significantly in improving survival of critically sick children.

Method: We retrospectively studied medical record of all children aged 1 month to 12 years old admitted in our PICU over a five years period. Data was collected in a predefined proforma that included age, gender, comorbidities and final diagnosis at the time of death. Patients who left the hospital against medical advice (LAMA) were also noted.

Result: Out of 3343 admissions, 292 patients died with mortality rate of 8.7%; male: female ratio of 1.5:1. 37.32% deaths belonged to 1month to 1 years age group and 48.48% cases died within 24 hours of admission. Respiratory System diseases were the commonest cause of mortality (28) followed by Infectious diseases(25%).

Conclusion: Mortality rate is quite low in our PICU. A higher mortality rate was associated with more severe condition of patients during admission to PICU.

Keywords: Pediatric Intensive Care Unit (PICU), Child Mortality, Critical Illness in Childre

INTRODUCTION

Intensive care unit has got a very important role in management of critically ill children. These patients who require continuous monitoring, hemodynamic support, respiratory support, advanced airway management are admitted in Pediatric Intensive Care Unit (PICU) to achieve better outcome [1]. 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.Present study was conducted to review the mortality pattern over the last 5 year period in our PICU and to compare the results with published national and international data. This assessment can provide valuable in finding local disease pattern as well as cases requiring more intensive management with the aim to predict and reduce the mortality. The information thus obtained can also be used to assess the existing services and further improving the facilities for optimum patient care.

MATERIAL AND METHODS

We reviewed the medical records of all children aged 1 month to 12 years old who were admitted in PICU and died from Jan 2021 to March 2025. Ours' is a 6 bedded well equipped PICU unit in a teaching hospital attached to a medical college in Latur. Postgraduate paediatric residents do round the clock floor duty which is supervised and guided by senior residents and consultants in the department. Data was collected from medical records in a predefined proforma that included age, gender, co morbidities and diagnosis at the time of death.. The cause of death was classified (ICD-10 coding system) on basis of primary system involved along with associated co-morbidities.

RESULTS

During five year of study period, a total of 3343 patients were admitted in PICU (mean 55.5 cases/ month). The bed occupancy rate was 85.18% per year with the turnover rate of 50.33. Among the study population, 2039 (61%) were males and 1303 (39%) were females , with a M:F ratio of 1.56:1. Out of patients admitted in Department of Paediatrics in the above time period, 3343 patients required Intensive care support. 292 patients succumbed to death, having a mortality rate of 8.7%

Over 5 years maximum deaths were observed in the year 2022-2023.Year wise distribution of deaths in PICU is shown in Table No 1.

YEAR WISE DISTRIBUTION-Table No 1.

YEAR	NO OF DEATHS
2021-2022	49
2022-2023	88
2023-2024	73
2024--2025	52
2025-APRIL 2025	27

Maximum number of death was observed in the age group of 1 month to 1 year accounting for 37.32% of deaths. Death rates were higher for males which may be due to higher number of males seeking admission in hospitals as shown in Table No 2

AGE AND SEX DISTRIBUTION OF TOTAL DEATHS IN PICU -Table No 2

AGE	MALE	FEMALE	TOTAL(%)
< 1 YEAR	59	50	109 (37.32%)
1-4 YEARS	41	32	73 (25%)
4-9 YEARS	26	35	61 (20.89%)
>10 YEARS	24	25	49 (16.78%)

Pneumonia was the major disease seen in our PICU followed by sepsis and bronchiolitis . Various diseases encountered in PICU are as listed in Table 3.
Diseases like bronchial asthma, rheumatic heart disease (RHD), PSGN, Bartter syndrome, renal tubular acidosis, SLE, liver cirrhosis, anaemia with complications, diabetes mellitus and complications etc were included in miscellaneous group.

DISEASE WISE DISTRIBUTION- Table No 3.

DISEASE	**PERCENTAGE**
Pnuemonia	28%
Sepsis	19%
Bronchiolitis	11%
Seizures	9%
AGE with severe dehydration	6%
Meningitis	6%
CHD	4%
Poisoning	4%
Others	13%

System wise evaluation showed respiratory system and infectious group at the top of the list followed by neurological cases . Around 67 (10.3%) cases had involvement of more than two systems. Table 4. shows system wise distribution of cases in PICU.

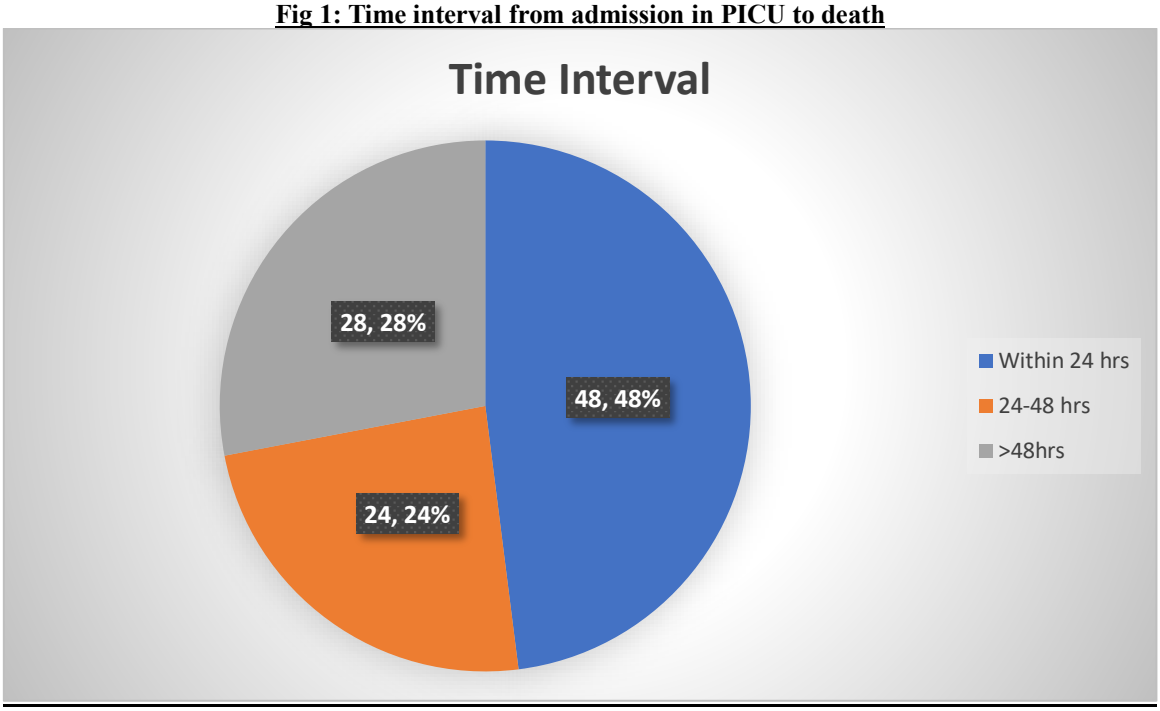
SYSTEM WISE DISTRIBUTION OF DEATHS IN PICU- Table No 4.

SYSTEM	PERCENTAGE
Respiratory	28%
Infectious	25%
Neurology	14%
Multisystem	14%
Cardiorespiratory	11%

Hematology	4%
Renal	3%
Endocrine	1%

Out of total deaths, approximately 48% died within 24 hours of in PICU. 24% cases succumbed to death between 24-48 hours and remaining 28% deaths occurred after 48 hours -Fig No 1.

Fig 1: Time interval from admission in PICU to death



Among total deaths, Septic shock was most common immediate cause of death followed by respiratory failure, multiorgan failure, DIC. Table No 5 depicts pattern of immediate cause of death.

Pattern Of Immediate Cause Of Death- Table No.5.

Immediate Cause Of Death	Percentage
Septic Shock	36%
Respiratory Failure	24%
Multiorgan Failure	22%
DIC	12%
Status Epilepticus	3%
Refractory Shock	2%
Others	1%

Out of total deaths in PICU, percentage of Iatrogenic cause of death was only 2%. Iatrogenic causes of death include Ventilator associated Pneumonia ,Hypotension. Prompt management and effective PICU response can prevent Iatrogenic causes of Death in PICU.

DISCUSSION

We have 3343 admissions in PICU over 5 year period with 292 deaths (mortality rate of 8.7%) which is in accordance with various published studies (range; 7%-15%). We postulate that one probable reason of low mortality rate observed by us could be due to high LAMA (Left Against Medical Advice) rate of critically sick children from our PICU. Most of these patients leave the hospital either due to financial constraint or parents' perception that the child won't survive from current illness.

In present study, we observed that 37.32% deaths belonged to patients 1 month to 1 years age group, which is on higher side. Higher proportion of male (61%) dying in present observation is in accordance with the study done by Siddiqui et al (60.5%)[1]. We observed that out of total deaths, 48.48% cases died within 24 hours of admission in PICU which is in contrary with study done by Shashikala et . They reported 16% deaths occurring within 24 hours of admission [10]. This

reflects either a poor health seeking behavior of parents or very late referral from peripheral health centres. We observed that respiratory diseases were most common causes of mortality (28%) followed by infectious diseases (25%).. Singhal and colleagues in their study also found respiratory condition (40%) as most common cause of death in their PICU followed by neurological diseases (27%) [14]. Apart from being a retrospective study, other limitations of present study include a high LAMA rate of critically sick patients from PICU (as we don't know the outcome of these sick children) and non-inclusion of paediatric surgical cases (they are admitted in surgical ICU after initial stabilization in PICU) . A well functioning PICU reduces morbidity and mortality in critically sick children. Low mortality rate observed in present study shows quality management of our PICU patients.

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