

Original Research Article

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Study of morbidity pattern and outcome of patients admitted in paediatric intensive care unit in a tertiary care rural teaching hospital

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ABSTRACT

Background: The care of the critically ill children remains one of the most demanding and challenging aspects in the field of paediatrics. The main purpose of Paediatric Intensive care unit is to prevent mortality by intensively monitoring and treating critically ill children who are considered at high risk of mortality. In the developing countries, there is a scarce data on paediatric critical care. Evaluation of the outcome of medical interventions can assess the efficacy of treatment. This helps in better decision making, improving the quality of care and modifying the future of management if required. This study will also help to study the causes of morbidity and mortality among paediatric age group in our hospital. Aims and Objectives of the study is to evaluate the morbidity pattern and outcome of admissions in the PICU of a rural teaching hospital, and to take measures to prevent morbidity and mortality by improving critical care facilities.

Methods: This was a retrospective study, the cases admitted in paediatric ICU in our teaching hospital in last two and a half considering the estimated sample size. Data will be collected from PICU and Medical record Department. Details will be studied with the help of medical record and will be analysed and interpreted according to the medical record details.

Results: During a period of 30 months of the study, total of 417 patients were admitted in our PICU. Of the total cases studied, Maximum i.e. 180(43.2%) had age below 1 year. The minimum – maximum range of age was between 1 day to 18 years. About 228(54.7%) cases were males and 189(45.3%) were females. The most common diagnosis was LRTI which was observed in 61(14.7%) of cases. The most common system involved was respiratory system which was observed in 101(21.8%) cases. Of total cases studied, 357(85.6%) were discharged, 36(8.6%) had DAMA (discharge against medical advice) and 24(5.8%) expired.

Conclusions: Mortality was low in our PICU. We conclude based on the present study that in our rural set up PICU, with better treatment protocols, skilled expertise/ Paediatric Intensivist we have chances to facilitate the care of critically ill patients giving desirable outcome.

Keywords: Critical care, Expertise, Mortality, Morbidity, PICU admission, Survival

INTRODUCTION

The key to understanding the present practice of intensive care for children lies with its history. “The past matters

more than we realize...we walk on its ground, and if we don't know the soil we are lost”. Modern pediatric critical care has its root in the development of adult intensive care and neonatal intensive care.¹ Intensive care has

become very important in the management of critically ill children. The care of critically ill children remains one of the most demanding and challenging aspects of the field of pediatrics. The main purpose of the PICU is to prevent mortality by intensively monitoring and treating critically ill children who are considered at high risk of mortality.² Although mortality in patients depends on many factors such as demographic and clinical characteristic of population, infrastructure and non-medical factors (management and organization), case mix, and admission practice, it is also affected by ICU performance.³

With the advancement in intensive care facilities, there is a dramatic increase in survival of critically ill children. Previous studies have shown significant positive impact of ICU physicians on the outcome in both children and adults. We, therefore, analyzed the data of our PICU to find out the pattern of diseases and outcome at our center which would help in proper resource allocation and better management of critically ill children.⁴

METHODS

This is a retrospective study based on the data collected from the Paediatric Intensive Care Unit (PICU) at BSTR hospital and MIMER Medical College Talegaon pune from the January 2016 to July 2018. Study population was the patients admitted in the PICU during this study period.

Inclusion criteria

All patients admitted in PICU underage group of 18 years during study period.

Statistical methods

The data on categorical variables is shown as n (% of cases). Being an observational non-comparative study, we did not compare the distributions of several categorical variables studied statistically. The entire data was entered and cleaned in MS Excel before its statistical analysis.

All results are shown in tabular as well as graphical format to visualize the frequency distributions of variables studied more clearly. The entire data is statistically analyzed using Statistical Package for Social Sciences (SPSS version 21.0, IBM Corporation, USA) for MS Windows.

The hospital is accredited with five bedded modern PICU which admits pediatric patient’s ≤18 years of age. PICU records of all admissions, transfer out, discharges, discharge against medical advice (DAMA) and death were utilized for the purpose of study. Data included Age, sex, diagnosis, duration of stay at PICU; outcome as far as unit is concerned was taken for study.

All patients in the unit were treated according to the written standard protocol. Relevant investigations including haemoglobin, total and differential leukocyte count, electrolytes, urea, creatinine, blood glucose, blood culture and arterial blood gas were done at admission. Blood tests were repeated subsequently whenever required. Cerebrospinal fluid analysis was done for suspected central nervous system infections. Treatment was started as per the protocol. Antibiotic therapy was modified whenever necessary depending upon the culture and sensitivity pattern. Vasopressors were used for patients in shock or poor perfusion.

RESULTS

During a period of 30 months of the study, total of 417 patients were admitted in this PICU at BSTR hospital and MIMER Medical College Talegaon, Pune.

Table 1: Age distribution.

Age Group (years)	No. of cases	% of cases
≤1.0 year	180	43.2
1-2 years	58	13.9
2-5 years	59	14.1
>5 years	120	28.8
Total	417	100.0

Table 2: Sex distribution.

Sex	No. of cases	% of cases
Male	228	54.7
Female	189	45.3
Total	417	100.0

Of 417 cases studied, 180(43.2%) had age below 1 year, 58(13.9%) had age between 1-2 years, 59(14.1%) had age between 2-5 years and 120(28.8%) had age above 5 years. The minimum-maximum range of age was 1 day to 18 years. Maximum number of patients belonged below 1 year age group, which can be attributed to lesser immunity.

Of 417 cases studied, 228(54.7%) were males and 189 (45.3%) were females. The male to female sex ratio in the entire study group was 1.21:1.0

Of 417 cases studied, the most common diagnosis was LRTI which was observed in 61(14.7%) of cases. This could be related to some epidemiological factors related to our area.

Of 417 cases studied, 357(85.6%) were discharged, 36 (8.6%) had DAMA(discharge against medical advice) and 24(5.8%) expired. Of 417 cases studied, the most common system involved was respiratory system which was observed in 101(21.8%) cases. This could be related to some typical epidemiology in this area.

Table 3: Distribution of diagnosis.

Diagnosis	No. of cases	% of cases
LRTI	61	14.7
Febrile convulsions	59	14.1
Insect / Snake Bite	34	8.2
Acute Gastroenteritis with dehydration	39	7.2
Viral fever	28	6.7
URTI	36	8.6
Hyperbilirubinemia	13	3.1
Dengue Fever	18	4.3
Congenital Heart Disease	18	4.3
Pyrexia of unknown origin	18	4.3
Head injury	16	3.8
Seizure disorders	14	3.4
Sepsis	14	3.4
Poisoning	14	3.4
Type 1 Diabetes Mellitus	6	1.4
Meningitis	5	1.2
Anemia	5	1.2
Hepatitis	4	1.0
ABO isoimmunisations	4	1.0
Protein energy malnutrition (PEM)	4	1.0
Meningoencephalitis	3	0.7
Nephrotic Syndrome	2	0.5
Asthma	2	0.5
Total	417	100.0

Table 4: Distribution of outcome.

Outcome	No. of cases	% of cases
Discharge	357	85.6
DAMA	36	8.6
Expired	24	5.8
Total	417	100.0

DISCUSSION

The PICU is a special unit primarily concerned with the care of patients with critical illness and demands a broad based knowledge to achieve good outcome. Advances in pediatric sub-specialties including the critical care medicine have improved the survival of sick children. During the 30 months study period, a total of 417 children were admitted to the 5 bedded PICU. Majority of the patients were males (54.7%) a finding similar to a study by Sahoo et al, and the Nigerian Study.^{2,3} Of the 417 cases studied, 180(43.2%) had age below 1 year, 58(13.9%) had age between 1-2 years, 59(14.1%) had age between 2-5 years and 120(28.8%) had age above 5 years. The minimum-maximum range of age was 1 day to 18 years. Maximum number of patients belonged below 1 year age group which was same as in Sahoo et al, Nigeria

and Nepal study.^{2,4} This study revealed that the most common system involved was respiratory system which was observed in 101(24.2%) cases., followed by Septicaemia/ Infectious diseases in 21.5% cases and Neurological system in 17.7% cases followed by Gastrointestinal in 14.3% cases. Our finding was similar to Sahoo et al,² and Nepal study⁴ but in Nigerian study, cardiovascular cause was leading.³

Table 5: Distribution of systemic involvement.

System involved	No. of cases	% of cases
Respiratory	101	24.2
Multi-organ/ Sepsis	90	21.5
Neurological	74	17.7
Gastrointestinal	60	14.3
Poisoning	27	6.5
Surgical	18	4.3
Cardiovascular	18	4.3
Haematological	9	2.1
Endocrinological	8	1.9
Genitourinary	4	1.0
Nephrology	3	0.7
Autoimmune	2	0.5
Dermatology	1	0.2
Metabolic	1	0.2
Psychological	1	0.2
Total	417	100.0

Our most common diagnosis was LRTI (14.7%) of all cases, followed by febrile convulsions (14.1%) cases. Similar findings were seen in Nepal and Brazilian study but contradictory to the AIIMS Delhi study and others.^{4,7} where Septicaemia was the commonest diagnosis. This shows that paediatric intensive care admissions vary in different countries and one should be aware of the prevalent conditions to develop the facilities and prepare treatment protocols accordingly.

Of the cases studied, 357(85.6%) were discharged, 36(8.6%) had DAMA (discharge against medical advice) and 24(5.8%) expired. Overall mortality in the study was 5.8% which was similar to Sahoo et al, (4.1 % but higher than Nigerian Study, 2.1 % and lower than Nepal study, 12.6%.^{3,4} Our set up was a resource limited setting with lack of manpower both doctors and Nurses, lack of technical expertise/ Intensivist, less Nurses per patient and lack of specialised equipments. However as compared to other studies with good set-up, our mortality rate was acceptable.⁸⁻¹²

The present study had a number of limitations. First it was based on secondary data, extracted retrospectively. This database did not contain information on the length of PICU Stay of each patient and also prior stay in the paediatric ward. Secondly, there is no mention of co-morbidities in this data and not reflecting on the study. Hence adequate analysis of the effect of each of these

sources may have had on the length of the stay and mortality could not be done.

CONCLUSION

We conclude based on the present study that in this rural set up PICU, Mortality was low. We conclude based on the present study that in this rural set up PICU, with better treatment protocols, skilled expertise/ Paediatric Intensivist we have chances to facilitate the care of critically ill patients giving desirable outcome.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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