

Outcome of Patients Admitted to Pediatric Intensive Care Unit in a Tertiary Care Hospital in West Bengal Region: A Retrospective Study

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Conflict of interest: Nil

Abstract

Background: This study was undertaken to know about the clinical profile and outcome of patients admitted in paediatric ICU in a tertiary care hospital.

Methods: This is a hospital based, retrospective, descriptive study, done on patients admitted to paediatric ICU, ICARE Institute of Medical Science and Research and Dr Bidhan Chandra Roy Hospital, Haldia, West Bengal, India for one year.

Results: As about 424 patients were admitted paediatric ICU. 79 patients were excluded from the study. Remaining 345 PICU patients were analysed. According to the age distribution of patients, it showed that < 1year were (25.2%), 1-5 years were (44.3%), > 5years of age were (30.4%). There was a female preponderance (58.8%), males were (41.1%). Patients from rural area were 243 (70.4%) and 102 (29.5%) from urban area. Clinical profile showed that pneumonia was the most common diagnosis (8.4%) for admission in PICU. This was followed by bronchiolitis (6.9%)(5.5%), enteric unknown fever bite in (5.2%) (6.6%), acute febrile severe seizures asthma (6.3%) (4.9%), poisoning, sepsis (6.0%) (4.6%), renal severe problems gastritis (5.7%) (4.3%), occult, clinical bacteremia dengue (3.7%), seizure disorder (3.4%), croup (3.1%), traumatic head injury (2.8%), wheeze associated LRI (2.6%), acute otitis media (2.3%), migraine (2.0%), meningitis (1.7%), CHD with complications (1.7%), severe anaemia with CCF (1.4%), acute urticarial (1.4%), foreign body (1.1%), electric shock (1.1%), scorpion sting (0.8%), viral hepatitis (0.8%) angioedema., clinical The malaria outcome (0.8%) noted, nephrotic was, (87.8%) syndrome were discharged, with complications (10.7%) (0.5%) patients, scrub went against typhus (0.2%) medical and advice, (0.2%) (1.4%) was patients were referred at parent's request.

Conclusions: Respiratory illness, infectious diseases, neurological problems and poisoning are the most common cause for PICU admissions. But seronegative dengue cases, electric shock, re-emergence of scrub typhus, are being increasingly also recommend diagnosed. better manpower So, emphasis and infrastructures therefore placed to improve on high the index outcome of suspicion of patients for admitted this type of two PICU. conditions.

Keywords: Clinical Profile, Outcome, Paediatric Intensive Care Unit.

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Introduction

The pediatric intensive care (PICU) is a part of the hospital where critically ill pediatric patients who require advanced airway,

respiratory, and hemodynamic supports are usually admitted with the aim of achieving an outcome better than if the patients were

admitted into other parts of the hospital.[1] Care of critically ill children remains one of the most demanding and challenging aspects in the field of pediatrics.[2] The principle objective of Pediatric critical care is not only to decrease the mortality, but also to restore the child who is suffering from a life threatening condition to health with a Minimum pain anxiety and complications and to provide comfort and guidance to the child's family.[3] according to World Health Organisation (WHO), the major causes of death in under-five children in developing countries are preventable and curable diseases, if the care is optimized.[4] But despite all the measures, ICU is one of the sites where medical errors are most likely to occur because of the complexity of the diseases, and multiple interventions. With advancement in intensive care facilities, there is a dramatic increase in survival of critically ill children. In critical care medicine, intensive care unit (ICU) results can be assessed on the basis of outcome such as mortality rate or survival.[5] In PICU it becomes important to audit admissions and their outcome, which may help to modify practices if necessary following thorough introspection, leading to better patient outcomes.[6] The primary focus of critical care has evolved from saving lives by monitoring and maintaining physiological status to placing greater emphasis on the prevention of secondary injuries and preservation of function.[7] Collection, analysis, and interpretation of relevant objective data on the utilization of ICU beds will help plan for reducing the length of ICU stay and facilitate covering more patients who require this care.[8] The aim of the present study was to describe the clinical profile and the outcome of our PICU patients, and also to highlight the probable modifications that can be done which will lead to better outcome of critically ill children.

Methods

This is a hospital based, retrospective, descriptive study, done on patients admitted to paediatric ICU, ICARE Institute of Medical Science and Research and Dr Bidhan Chandra Roy Hospital, Haldia, West Bengal, India for one year. Children less than 13 years admitted to PICU with complete patient information along with the investigation reports in the medical records were included in the study. Children with medical records with incomplete information were excluded. The patients needed for this study were identified by reviewing our PICU nominal register. The hospital records of these patients admitted to PICU were retrieved from the medical records department following due permission. Out of 424 patients admitted to PICU, 79 were excluded. The remaining 345 patients were analysed. Quantitative variable was clinical profile and outcome pattern. Statistical analysis used was simple proportion test. The following data was collected from the medical records department (MRD) about the patients included in this study-gender, age, address, provisional and final diagnosis of the patient, date of admission. Outcome was noted as discharge/against medical advice/referred. History, examination details, investigations done were noted (CBC, CRP, serum bilirubin, chest x-ray, USG abdomen, neuroimaging, EEG, ABG, CSF analysis, urine routine, microscopy, stool for occult blood, LFT, RFT), course in the hospital and treatment given were recorded.

Results

Out of the 424 patients admitted to pediatric ICU, 79 were excluded, since they were not able to fulfill the inclusion criteria. Clinical profile and outcome of the remaining, 345 patients were analysed. According to the socio demographic pattern, age distribution of patients showed that < 1year were 87 (25.2%), 1-5 years were 153 (44.3%), > 5yrs of age were 105 (30.4%). There was a female preponderance 203 (58.8%), males

were 142 (41.1%). Patients from rural area were 243 (70.4%) and 102 (29.5%) from urban area (Table 1).

Table 1: Sociodemographic data of patients admitted to PICU (n=345).

Data	Number	Percentage (%)
Age		
< 1 year	87	25.2
1-5 years	153	44.3
>5 years	105	30.4
Gender		
Male	142	41.1
Female	203	58.8
Residence		
Urban	102	29.5
Rural	243	70.4

Clinical profile showed that pneumonia was the most common diagnosis 29 (8.4%) for admission in PICU.

This was followed by bronchiolitis 24 (6.9%), enteric fever in 23 (6.6%), febrile seizures 22 (6.3%), poisoning 21 (6.0%), renal problems 20 (5.7%), occult bacteremia 19 (5.5%), unknown bite 18 (5.2%), acute severe asthma 17 (4.9%), sepsis 16 (4.6%), severe gastritis 15 (4.3%), clinical dengue 13 (3.7%), seizure disorder 12 (3.4%), croup 11 (3.1%), traumatic head injury 10 (2.8%), wheeze associated LRI 9 (2.6%), acute otitis media 8 (2.3%), migraine 7 (2.0%), meningitis 6 (1.7%),

CHD with complications 6 (1.7%), severe anaemia with CCF 5 (1.4%), acute urticaria 5 (1.4%), foreign body 4 (1.1%), electric shock 4 (1.1%), scorpion sting 3 (0.8%), viral hepatitis 3 (0.8%), clinical malaria 3 (0.8%), nephrotic syndrome with complications 2 (0.5%), scrub typhus 1 (0.2%) and about 1 (0.2%) was angioedema (Table 2).

The outcome noted was, out 345 patients admitted to paediatric ICU, 303 (87.8%) were discharged. About 37 (10.7%) patients went against medical advice. About 5 (1.4%) patients were referred at parents request (Table 3).

Table 2: Distribution of PICU patients according to clinical profile (n=345).

Data	No.	Percentage
Diagnosis		
Pneumonia	29	8.4
Bronchiolitis	24	6.9
Enteric fever	23	6.6
Febrile seizures	22	6.3
Poisoning	21	6.0
Renal problem	20	5.7
Occult bacteremia	19	5.5
Unknown bite	18	5.2
Acute asthma	17	4.9
Sepsis	16	4.6
Severe gastritis	15	4.3
Clinical dengue	13	3.7
Seizure disorder	12	3.4

Croup	11	3.1
Traumatic head injury	10	2.8
Wheeze associated LRI	9	2.6
Acute otitis media	8	2.3
Migraine	7	2.0
Meningitis	6	1.7
Congenital heart disease with Complications	6	1.7
Severe anaemia with CCF	5	1.4
Acute urticaria	5	1.4
Foreign body	4	1.1
Electric shock	4	1.1
Scorpion sting	3	0.8
Viral hepatitis	3	0.8
Clinical malaria	3	0.8
Nephrotic syndrome with complications	2	0.5
Scrub typhus	1	0.2
Angioedema	1	0.2

Table 3: Distribution of PICU patients according to outcome pattern.

Data	No/percentage (%)
Discharged	303 (87.8)
Referred	5 (1.4)
Against medical advice	37 (10.7)

Discussion

In this study, out of 345 patients admitted to paediatric ICU, according to the sociodemographic pattern, age distribution of patients showed that < 1 year of age were 87 (25.2%), 1-5 years were 153 (44.3%), > 5 years were 105 (30.4%). Similar results were seen in a study conducted in Israel.[9] Female patients (58.8%) outnumbered male patients (41.1%) in PICU admissions.

But males outnumbered female patients in a study conducted by Praveen et al, and in African studies.[10,11] Patients from rural area were (70.4%) outnumbered urban area cases (29.5%). This could be due to the increased number villages around our tertiary care center.

Clinical profile showed that pneumonia was the most common diagnosis 29 (8.4%) for admission in PICU. This was followed by bronchiolitis 24 (6.9%), enteric fever in 23 (6.6%), febrile seizures 22 (6.3%), poisoning 21 (6.0%), renal problems 20 (5.7%), occult bacteremia 19 (5.5%),

unknown bite 18 (5.2%), acute severe asthma 17 (4.9%), sepsis 16 (4.6%), severe gastritis 15 (4.3%), clinical dengue 13 (3.7%), seizure disorder 12 (3.4%), croup 11 (3.1%), traumatic head injury 10 (2.8%), wheeze associated LRI 9 (2.6%), acute otitis media 8 (2.3%), migraine 7 (2.0%), meningitis 6 (1.7%), CHD with complications 6 (1.7%), severe anaemia with CCF 5 (1.4%), acute urticaria 5 (1.4%), foreign body 4 (1.1%), electric shock 4 (1.1%), scorpion sting 3 (0.8%), viral hepatitis 3 (0.8%), clinical malaria 3 (0.8%), nephrotic syndrome with complications 2 (0.5%), scrub typhus 1 (0.2%) and about 1 (0.2%) was angioedema. This study has shown respiratory illness and infectious diseases as the most common clinical profile observed. Similar findings was observed in a study done in Coimbatore in which respiratory illness was the most common reason for PICU admission.[12] But study conducted in Bihar showed that neurological diseases followed by respiratory illness was the most common reason for admission.[13]

The outcome noted was, out 345 patients admitted to paediatric ICU, 303 (87.8%) were discharged. About 37 (10.7%) patients went against medical advice and 5 (1.4%) patients were referred at parents request. But a study conducted in West Bengal region showed that only (52.5) improved and (19.5%) of patients were referred/went against medical advice.[14]

Since it is a retrospective study, it lacks follow up in patients admitted PICU and also referred patients. The clinical and outcome profile reported in this study, may therefore be an underestimation.

Conclusion

Respiratory illness, infectious diseases, neurological problems and poisoning are the most common cause for PICU admissions. But seronegative dengue cases, electric shock, reemergence of scrub typhus, are being increasingly diagnosed. So, emphasis is therefore placed on high index of suspicion for these types of conditions.

Authors also recommend better manpower and infrastructure to improve the outcome. But since this is a retrospective study with small sample size, the authors would like to recommend for further detailed prospective studies in future, with emphasis on the awareness of the most common and emerging rare etiology of patients admitted to PICU.

References

1. Abhulimhen-Iyoha BI, Pooboni SK, Vuppali NK. Morbidity Pattern and Outcome of Patients Admitted into a Pediatric Intensive Care Unit in India. *Indian J Clin Med.* 2014;5:1-5.
2. Jain S, Bhalke S, Srivastava A. A study of morbidity pattern in PICU at Tertiary Care Center. *J Pediatr Crit Care.* 2018; 5(5):23-5.
3. Das I, Bezboruah G, Pathak K, Rahman M. Clinical profile and Outcome of Patients Admitted in Pediatric Intensive Care Unit of Gauhati Medical College & Hospital. *IOSR J Dental Med Sci.* 2017 Dec;16(12):27-9.
4. Haftu H, Hailu T, Medhaniye A. Assessment of pattern and treatment outcome of patients admitted to pediatric intensive care unit, Ayder Referral Hospital, Tigray, Ethiopia, 2015. *BMC Research Notes.* 2018 Dec;11(1):339.
5. Sahoo B, Patnaik S, Mishra R, Jain MK. Morbidity pattern and outcome of children admitted to a paediatric intensive care unit of Eastern India. *Int J Contemp Pediatr.* 2017 Mar;4(2):486-9.
6. Mridha D, Saha S, Ganguly S, Bose K. A Retrospective Evaluation of Morbidity Pattern and Outcome of Patients Admitted into a Pediatric Intensive Care Unit in India. *J Med Sci Clin Res.* 2017 Nov;5(11):30586-90.
7. Heneghan J, Pollack MM. Morbidity: Changing the Outcome Paradigm for Pediatric Critical Care. *Pediatr Clin North Am.* 2017 Oct;64(5):1147-65.
8. Bharuka S. To Study the Profile of Children Admitted in Pediatric Intensive Care Unit of a Rural Medical College, Hospital. *J Adv Scholarly Rese Allied Educ.* 2017 Oct;14(1):21-5.
9. Lanetzki CS, Oliveira AC, Bass LM, Abramovici S, Troster EJ. The epidemiological profile of Pediatric Intensive Care Center at Hospital Israelita Albert Einstein. *Einstein.* 2012 Jan-Mar;10(1):16-21.
10. Khilnani P, Sarma D, Singh R, Uttam R, Rajdev S, Makkar A. Demographic profile and outcome analysis of a tertiary level pediatric intensive care unit. *Indian J Pediatr.* 2007;71:587-91.
11. Embu HY, Yiltok SJ, Isamade ES, Nuhu SI, Oyeniran OO, Uba FA. Paediatric admissions and outcome in a general intensive care unit. *Afr J Paediatr Surg.* 2011;8(1):57-61.
12. Rukmani J, Kumar N. Clinical profile and outcome of PICU in a tertiary care hospital in south India. *RA J Applied Resea.* 2017 May;3(5):902-7.

13. Kumar R, Kishore S, Kumar R, Prakash J. Clinical profile and outcome in a paediatric intensive care unit in a tertiary level centre of Bihar. *Int J Med Paediatr Oncol.* 2019;5(3):89-92.
14. Jyothi AK, Ankireddy K. A study on clinical profile and outcome of patients in PICU (paediatric intensive care unit) at a tertiary care unit. *Int J Contemp Pediatr.* 2019 Mar; 6(2):757-60.