ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at:www.ijmacr.com

Volume – 7, Issue – 4, August - 2024, Page No. : 190 – 195

Clinical Profile, Outcome & Mortality Pattern of Children Admitted in PICU at Tertiary Care Level Hospital

[1]Dr. Nirav Garasiya, Assistant Professor, Department of Pediatric, GMERS Medical College, Valsad

[2]Dr. Priyansi Patel, Assistant Professor, Department of Pediatric, GMERS Medical College, Valsad

[3]Dr. Pathik Patel, Assistant Professor, Department of Pediatric, GMERS Medical College, Valsad

[4]Dr. Kunjal Kantharia, Senior Resident, Department of Pediatric, GMERS Medical College, Valsad

Corresponding Author: Dr. Nirav Garasiya, Assistant Professor, Department of Pediatric, GMERS Medical College, Valsad

How to citation this article: Dr. Nirav Garasiya, Dr. Priyansi Patel, Dr. Pathik Patel, Dr. Kunjal Kantharia, "Clinical Profile, Outcome & Mortality Pattern of Children Admitted in PICU at Tertiary Care Level Hospital", IJMACR- August - 2024, Volume – 7, Issue - 4, P. No. 190 – 195.

Open Access Article: © 2024, Dr. Nirav Garasiya, et al. This is an open access journal and article distributed under the terms of the creative common's attribution license (http://creativecommons.org/licenses/by/4.0). Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: The mortality in PICU can reflect a hospital's health care quality and efficiency on handling with critical ill patients. So, reducing the mortality in PICU will lead to reduce the overall mortality in children. Mortality in patients in PICU 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 PICU performance.

AIMS: To determine clinical profile, etiology, mortality pattern & outcome of children admitted in PICU.

Material & Methods: It is retrospective observational study done at tertiary care centre. Data collected on patients included age, gender, diagnosis, weight, duration of stay. All patients are managed by standard protocols and guidelines.

Result: Male to female ratio (M:F – 1.7 : 1). (figure –1) The most common aetiology in our PICU patients were Pneumonia 42. Out of 207 admissions, total number of death were 26. Mortality was higher in those who referred from casualty and referred from other hospitals. Mortality was found more in age less than 5 years (76.9%) than age greater than 5 years (23.1%).

Conclusion: A well-functioning and advanced PICU reduces morbidity and mortality in critically sick children. Low mortality rate observed in present study shows quality management of our PICU patients.

Keywords: Infant Mortality rate, Advanced PICU facilities.

Introduction

The neonatal, infant and under - 5 morbidity and mortality along with life expectancy at birth are very important indicators of health status of a population. The paediatric intensive care unit (PICU) is a part of the hospital where critically ill paediatric patients requiring advanced airway, respiratory, and hemodynamic supports are treated with the main aim of achieving an outcome better than if the patients were admitted into other parts of the hospital like wards.[1,2]

The mortality in PICU can reflect a hospital's health care quality and efficiency on handling with critical ill patients. So, reducing the mortality in PICU will lead to reduce the overall mortality in children. It becomes important to audit and observe admissions and their outcome. So, it may help to modify practices and management of patients if necessary following thorough introspection, leading to better patient outcomes. Evaluation of the outcomes of medical interventions can assess the efficacy of treatment, making it possible to take better decisions, to further improve quality of care, to standardize conduct, and to ensure effective management of the high-level resources needed to deliver intensive care services thereby optimizing resource utilization.[5] Although mortality in patients in PICU 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 PICU performance.[6]

The principal objective of paediatric 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]

In this study, authors aimed to identify the indication for PICU admission and outcome and to correlate the cause for poor outcome. The knowledge of the clinical profile and outcome of critically ill children helps in planning health policies. With progresses in medical knowledge of paediatric anaesthesia, medicine and surgery, understanding of life-threatening pathophysiology processes, and development of scientific and technical methods to monitor, the paediatric critical care medicine developed rapidly.[4]

Aims & Objectives: To determine clinical profile, etiology of children admitted in PICU.

To evaluate the morbidity and mortality pattern and outcome of admissions into the PICU of a tertiary care center in India.

Methods & Materials

It is retrospective observational study done at tertiary care centre, GMERS Medical college & hospital, Valsad. Study period was 1st November 2022 to 31st July 2023.

Inclusion criteria: All patients more than 1 month to 14 years of age who fulfilled the criteria of admission in PICU as per protocol of this institute.

Exclusion criteria: All surgical cases. Patients who were very critical at time of admission and expired within 6 hours of admission.

The hospital has a well-equipped 10 bedded PICU with latest and advanced facilities including ventilator and a team of well trained staff. We admit paediatric patients less than 14 years of age. PICU records of all admissions, transfers out, referred, discharges, and deaths were analyzed. Data collected on patients included age, gender, diagnosis, weight, duration of stay.

©2024, IJMACR

All patients are managed by standard protocols and guidelines. All relevant investigation done during management and repeat if required.

The outcome was classified as transfers to the main paediatric wards after recovery, discharges, left against medical advice (LAMA), referral discharge and death.

Ethics

This study approved by ethical committee.

Result

During this study period, there were 207 total PICU admissions. Out of these 132 (63.8%) were male and 75 (36.2%) were female. Male to female ratio (M:F – 1.7 : 1). (Figure –1)

In our study, 94(45.4%) patients below 1 years of age. 68(32.8%) were between 1 to 5 years of age & 45(21.8%) were more than 5 years to 14 years of age. (Table – 1)

Out of total PICU admissions, 43 (20.8%) were admitted from OPD, 61(29.5%) from casualty, 34 (16.4%) from the paediatric ward, referred from other hospitals were 69 (33.3%). (Figure -2)

The most common aetiology in our PICU patients were Pneumonia 42. Others were Septicemia 21, epilepsy 19, Bronchiolitis 16, Asthma 14, Congenital heart disease 12, Cerebral palsy & SAM were 10, Meningitis 9, Febrile convulsions, TB Meningitis, viral encephalitis were 6, hepatic encephalitis, diabetic ketoacidosis & severe anemia with CCF were 4, dengue, snake bite & OP poisoning were 3, congestive cardiac failure & aspiration pneumonia were 2, Foreign body, Drowning, Leukemia, Hyponatremic convulsions, Aplastic Anemia were 1 children. (Figure – 3)

In PICU, out of total admission 57(27.53%) patients required inotropic support and 46 (22.22%) patients required mechanical ventilatory support. (Table -2)

Out of 207 admissions, total number of death were 26. Mortality of our PICU was 12.6%. There were 12 (46.2%) children expired between age of 1 month to 1 year of age. 9 (34.6%) children between 1 year to 5 years of age and 5 (19.2%) children expired between 5 years to 14 years of age. (table -3)

There were 34 (16.4%) patients staying less than 48 hours in PICU. 106 (51.2%) patient's duration of stay were 2 to 7 days and 67 (32.4%) had more than 7 days of duration. Out of them 34.6% (09) of mortality occurred within 48 hours of duration. 42.3% (11) mortality within 2 to 7 days and 23.1% (06) of mortality within more than 7 days of duration in stay in PICU. (Table-4)

In our PICU, 113 (54.6%) patients were transferred to paediatrics wards in our hospital for further care. 57(27.5%) were discharged. 7(3.3%) patients refer to higher centre which have more advanced management facilities. Mortality was 26 (12.6%) and LAMA (left against medical advice) was 4 (2%). (Table – 5)

Discussion

Out of total 207 PICU admissions 132 were male and 75 were female M:F-1.7 : 1. Abhulimhen-Iyoha BI et al, found male: female ratio of 1.5:1[9] and Shah GS et al, found the male to female ratio to be 1.7:1.[10] In present study, majority of children 162 (78.2%) admitted in PICU were infants and under 5 years of age. Similar result 83.33% children under 5 years of age were reported in Jyothi AK et al [7] and in El Halal MG et al, 78.3% were under 5 years of age.[8]

Source of admission in PICU were reported from casualty 61(29.5%) & referred from other hospitals were 69 (33.3%). Our medical college is surrounded by many tribal and forestry districts. So, majority of patients were referred from these primary health care & community health care centres.

©2024, IJMACR

In this study, major system involved in PICU admission was respiratory system (35.7%) in which aetiologies are pneumonia, bronchiolitis, asthma & LRTI, Followed by central nervous system (27.1%) in which aetiologies are pyogenic & tubercular meningitis, cerebral palsy, epilepsy, viral encephalitis & febrile convulsions. Other patients mainly involved cardiovascular system. This result is comparable with Shah GS et al, in which respiratory diseases contributed to the maximum number of cases (33%) followed central nervous system (18.6%).[10] Earan SK et al, also found that respiratory system was the commonest system (40.2%) involved in PICU admission.[11] Other indications to admit in PICU were sever acute malnutrition, poisoning, snake bites, diabetic ketoacidosis, sickle cell crisis, dengue fever.

Requirement of mechanical ventilation and inotropic support in PICU are common and crucial. In this study,27.53% of patients required inotropic support & 22.22% of children required mechanical ventilation. Sharma et al, reported that inotropic support was required in 27.85% and mechanical ventilation was required 34.14% of patients.[12]

Mortality in this study is 26 (12.6%). It is found more in age less than 5 years (76.9%) than age greater than 5 years (23.1%). In sharma et al, mortality was 14.3%.[8] In El Halal MG et al, mortality was 10.3% and mortality in less than 5 years of age group was 78.3% which is similar to our study result.[12] In study of Rashma RP et al, mortality in PICU was 10.58%.[13] We observed Infectious causes were most commonly involved in mortality.

Majority in patients who died within <48 hours of admission was 9 out of 34 admissions, 26.5%. 11, 10.4% (out of 106) mortality occurred in children who stayed between 2 to 7 days and 6, 8.9% (out of 67) mortality observed in patients who stayed more than 7 days. Mortality was higher in those who referred from casualty and referred from other hospitals. This is same result observed by Rashma RP et al.[13] Om Prakash et al. was found that out of total 91 deaths, 32.96% cases died within 24 hours of admission in PICU[14] which is similar to our study. This data reflects either a poor health seeking behaviour of parents, lack of awareness about disease or difficulties in referral from peripheral health centres. Shashikala et al. reported 16% deaths occurring within 24 hours of admission [15] which is contrary to our result.

Conclusion

A well-functioning and advanced PICU reduces morbidity and mortality in critically sick children. Low mortality rate observed in present study shows quality management of our PICU patients. A higher mortality was associated with more critical conditions of children at time of admission and present with any co morbidities. So better care and management should be given for those children admitted to PICU with severe co morbidities. Infections is one of the major cause which leads high mortality in PICU. Therefore, the source of infection which is either hospital acquired or community acquired should be identified immediately and managed aggressively.

For better outcome and to reduce mortality, there should be standard management protocol, well trained staff and hygiene is required according to epidemiology and course of various disease. Also, awareness about immunization, preventable diseases in parents and community required. Strong referral system from primary health and community health centre to higher or tertiary care centre is also required to reduce mortality overall.

©2024, IJMACR

References

1. Singh O P. Kaul K K; Morbidity and Mortality profile of NICU in a zonal hospital of armed forces in central India, a retrospective study; IJAR; Volume-8 | Issue-2 | February 2018 | ISSN - 2249-555X | IF: 5.397 | IC Value: 86.18.
2. Young MP, Birkmeyer JD. Potential reduction in mortality rates using an intensivist model to manage intensive care units. Eff Clin Pract. 2000;3:284-9.
3. Wheeler DS, Wong HR, Shanley TP, eds. Pediatric Critical Care Medicine. London: Springer, 2009;1.
4. Committee on Hospital Care of the American Academy of Pediatrics and Pediatric Section of the Society of Critical Care Medicine. Pediatrics. 1993 Jul;92(1):166-75. PMID: 8516070.
5. Fiser D.H. Outcome evaluations as measures of quality in pediatric intensive care. Pediatr Clin North Am. 1994; 41: 1423–1438.
6. Bertolini G., Donata R.A.C., Apolone G. PRISM—an assessment of its performance in a sample of 26 Italian ICU'S. Crit Care Med. 1988; 26: 1427–1432.
7. Jyothi AK, Ankireddy K. A study on clinical profile and outcome of patients in PICU (paediatric intensive care unit) at tertiary care unit. Int J Contemp Pediatr 2019;6:757-60
8. El Halal MG, Barbieri E, Mombelli Filho R, de Andrade Trotta E, Carvalho PR. Admission source and mortality in a pediatric intensive care unit. Indian J Critical Care Med. 2012:16(2);81-6.
9. Abhulimhen-Iyoha BI, Pooboni SK, Vuppali NK. Morbidity pattern and outcome of patients admitted into a pediatric intensive care unit in India. Indian J Clinical Med. 2014;5:IJCM-S13902.
10. Shah GS, Shah BK, Thapa A, Shah L, Mishra OP. Admission patterns and outcome in a Pediatrics intensive care unit in Nepal. British J Med Med Res. 2014;4(30):4939-45.
11. Earan SK, Dhandapani LM, Arunagirinathan A, Kantamneni S. Clinical spectrum and epidemiological profile of patients admitted to Pediatrics intensive care unit at a tertiary care centre in South India. Int J Scientific Study.2016:4(3); 187-91.
12. Arun K Sharma, Binay Gaurang; Profile and Outcome of Patients Admitted to Pediatric Intensive Care Unit at a General Referral Hospital. JIOM Nepal. Vol 41 No 3. Dec 2019, page 17-23.
13. Rashma RP, Remya S, Jayakumar C, Shanavas M, Manu R, et al. (2018) Mortality Profile of Children Admitted to Intensive Care Unit of a Tertiary Care Hospital in Kerala, South India. Int J Med Clin Sci Vol: 1, Issu: 1 (13-16)
14. Om Prakash singh, Neeraj anand, a retrospective evaluation of the morbidity pattern and outcome of patients admitted in a pediatric intensive care unit in india. Vol-9|Issue-6|June-2019|PRINT ISSN No. 2249 - 555X|44-46.
15. Shashikala V, Begum A, Kumar C S. Analysis of Mortality in PICU of A Tertiary Care Teaching Hospital in Telangana. Journal of Dental and Medical Sciences. 2016; 15(5):07-12. DOI: 10.9790/0853-1504081317.

©2024, IJMACR

Legend Figures & Tables

Figure 1: Gender distribution

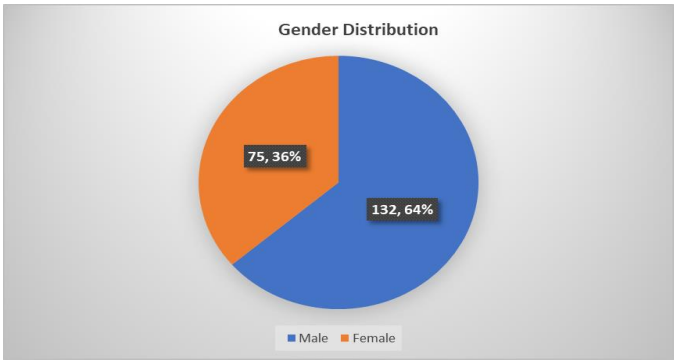

Figure 2: Source of admission in PICU

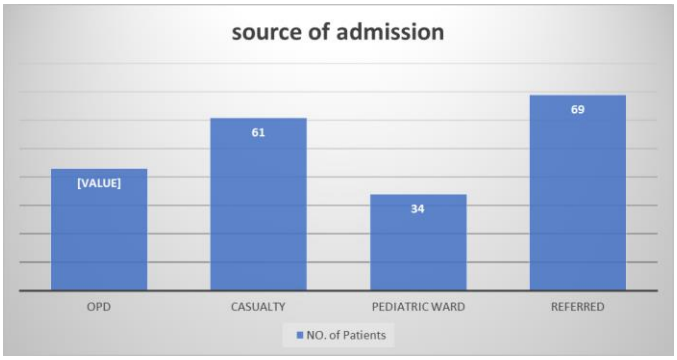

Figure 3: Distribution of patients according to aetiology

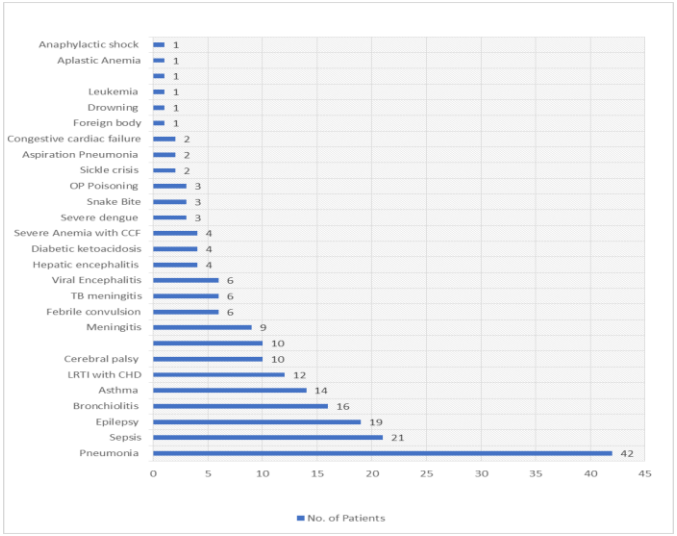

Table 1: Age distribution of patients in study

Age group	No. of patients
>1month to <1 year	94(45.4%)
1year -5 year	68(32.8%)
> 5 year -14 year	45(21.8%)

Table 2: Support of inotropes & mechanical ventilation

Types of supports	No. of patients (n=207)
Inotropes	57 (27.53%)
Mechanical ventilation	46 (22.22%)

Table 3: Mortality according to age

Age	Death (n=26)
>1Month to <1 year	12 (46.2%)
1yr to 5 years	09 (34.6%)
>5yr to 14 years	05 (19.2%)

Table 4: Mortality according to duration of PICU stay

Duration	No. of Patients (n=207)	Death (n=26)
<48 hours	34 (16.4%)	09 (34.6%)
2 to 7 days	106 (51.2%)	11 (42.3%)
>7 days	67 (32.4%)	06 (23.1%)

Table 5: Outcome

Outcome	No. of Patients
Transfer to ward	113 (54.6%)
Discharge	57 (27.5)
Refer to higher centre	07 (3.3%)
Death	26 (12.6%)
LAMA	04 (2%)

©2024, IJMACR