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Original Research Article

Morbidity Pattern and Outcome of Children Admitted between 1 Month-12 years in Pediatric Intensive Care Unit in Tertiary Care Centre in Rural South India: A Retrospective Study

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Abstract

Background: Pediatric intensive care has evolved in various domains in last two decades. Early recognition of danger signs, adequate stabilisation of sick children and safe referral of critically ill children, appropriate assessment and management of such children in tertiary care centre are key components in saving young lives. Analysing the type of admissions, assessing need of infrastructure, medications, manpower will aid in improving the level of care in sick children admitted in intensive care.

Aims and objectives: Primary objective of this study is to analyse the pattern of admission and outcome of children who were admitted in rural pediatric intensive care unit in south India Analysing the type of admissions, assessing need of infrastructure, medications, manpower will aid in improving the level of care in sick children admitted in intensive care.

Methods and Materials: A Retrospective analysis of case record of children between 1 month-12 year admitted in Pediatric intensive care of Governmaent Villupuram Medical College during the periodof January 2018-December 2018 was done. Demographic profile, morbidity pattern and outcome of those children were analysed.

Results: Out of 458 cases admitted during the study period 412 were discharged, 26 children expired and 20 left against medical advice. Most common age group admitted was infants 41.9% and male childern were more (63.1%). Out of this 458 children, 71% of children were from lower class as per updated BG Prasad scale. Most common system involved in children admitted was neurological system 33.4% followed by respiratory system 27.9%. Most common disease for which children were admitted was seizure disorder 17.9% followed by pneumonia 17%.76% of ventilated children were successfully discharged.

Conclusion: Morbidity pattern is not the same in all intensive care units. Detailed analysis of Morbidity pattern will help the Intensive care team to be prepared to handle sick children and save their lives.

Keywords: Morbidity Pattern, Pediatric Intensive Care, Sick Children.

Introduction

Children admitted in critically ill state in toall intensive care don't follow same pattern of illness. The morbidity pattern differs from unit to unit and it is different in rural and urban set up. Pediatric intensive care plays a vital role in receiving and managing such children. Rapid pediatric assesment of critically ill children is mandatory at receiving point for which the health care personnel should be adequately trained. Primary goals of PICU is to decrease the mortality by providing early stabilisation, periodic assessment, timely intervention, ordering needed investigation and initiating management as per the disease state.

Intensive care management is expensive and especially in developing countries and in rural areas the accessibility and availabilty of intensive care is often limited. More children are being referred from primary and secondary care system for intensive care services [1]. Being a sensitive area counselling the care givers, consoling them also a mandatory part of PICU care. Periodic assessment, recognition of change in hemodynamics, performimg needed emergency procedures are also key in managing sick children. Proper preventive measures likeimproving nutritional status of the children, administration of vaccines as per schedule, creating awareness among care givers about hygienic practices, seeking timely medical advices have tremendously decreased the morbidity and mortality of children in last decades.

Appropriate allocation of resources like equipments, consumables, medications, manpower also will improve outcome [1,2]. The impact of these will definitely reflect in outcome. Moreover the PICU Health personnels should be periodically trained in Pediatric emergencies and life support. There are many studies conduced in various parts of the world to analyse the need of strengthening the intensive cares. In order to strengthen the PICU it is mandatory for each unit to know the morbidity pattern of their own unit so that they can be very well trained and equipped as per the need.

This study will aid in analysing thepattern of diseases in critically ill children and therefore help the unit to be prepared in all domains so that primary objective is achieved.Moreover based on this study, evidence based standard operating procedures and protocols can be framed which will help in emergency initiation of management and hence decrease mortality in children [3].

Materials and Methods

This descriptive study conducted in Pediatric Intensive care unit of Government Villupuram Medical College and Hospital over a period of one year from January 2018-December 2018 by a retrospective analysis of case records of children admitted between 1mth-12 year age group.Our PICU is a ten bedded ,fully equipped one to cater the needs of children predominantly from rural areas.

Age, sex Socioeconomic status, system involved, diagnosis and outcome of the children admitted were retrieved from case records. Data obtained from the case records were tabulated and analysed using frequency and percentage and nominal data were compared using chi square test whereever applicable. SPSS Version 23 was used for this analysis.

Results

During the study period of January 2018-December 2018, a total of 458 cases were admitted in PICU.

Age

Out of these 41.9% (n=192) were between the age group of 1month -1yr, 36.6% (n=168) were between 1-5yrs and 21.3% (n=98) were between the age group of 6-12 yrs. The mean age being 5.9yrs.

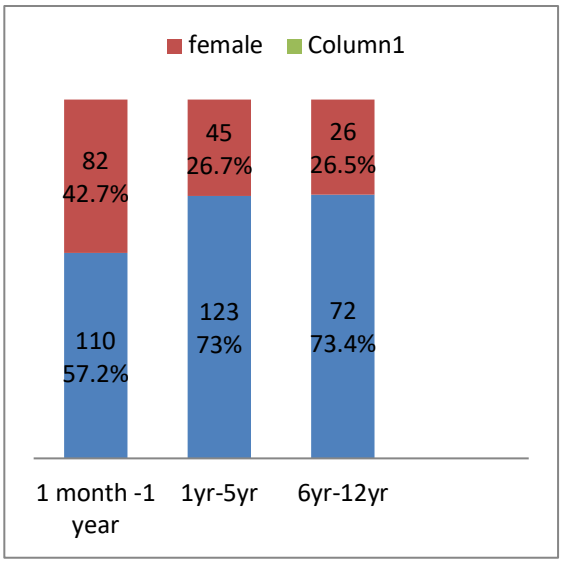

Figure 1: Age distribution of children admitted in PICU

Sex

Male children accounted for 63.1% (n=289) and female children were 169 (36.9%) with M:F ratio of 1.7:1.

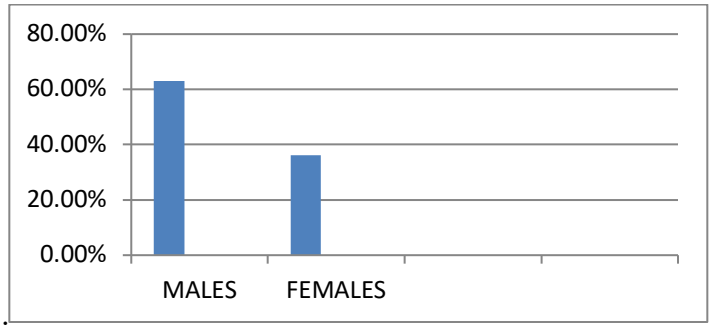

Figure 2: Sex distribution of children admitted in PICU

Socio-economic class and residence

Out of 458 cases, 89.5% (n=410) were from lower class and 10.5% were from lower middle class as per updated BG Prasad scale and 83.4% (n=382) were from rural area and 16% (n=76) were from urban area.

System- wise cases

Table 1: Systemwise cases

Total admissions=458		
Diagnosis	Admitted	Expired
Neurological system	153(33.4%)	10(38%)
Respiratory system	128(27.9%)	7(26.9%)
Cardiovascular system	22(4.8%)	3(11.5%)
Scorpion sting	39(8.5%)	2(9%)
Snake bite	34(7.4%)	1(5%)
Renal system	5(1%)	-
Others	10(2%)	3(9%)

The most common system involved in admitted cases was Neurological system 33.4% (n=153), Respiratory system 27.9% cases (n=128), Cardiovascular system 4.8% (n=22), Scorpion sting envenomation 8.5% (n=39), Snake bite with complications 21 (4.5%), Renal 5 (1%) and others being 2.1%(n=10).

Common diseases for admission

Some of the common systemic diseases for which children were admitted are Seizure disorder 17.9%(n=82), Pneumonia 17%(n=78), AGE with severe dehydration 4.1%(n=19), Meningo-encephalitis 5.2%(n=24), Infections like Dengue, Scrub Typhus, Enteric fever accounted for 1%(n=5).

Table 2: Disease pattern of children admitted in PICU

Total admissions =458				
Primary disease	Males	Females	Total	Primary disease
Seizure disorder	46	36	82	Seizure disorder
Pneumonia	22	15	37	Pneumonia
Bronchiolitis	18	12	30	Bronchiolitis
Bronchial asthma	8	3	11	Bronchial asthma
Acute gastroenteritis	12	7	19	Acute gastroenteritis
Meningoen cephalitis	18	6	24	Meningoencephalitis
Heart diseases	10	8	18	Heart diseases
Nephrotic syndrome	4	1	5	Nephrotic syndrome
Infection	6	4	10	Infection

Children transferred out to ward and discharged were 89.9% (n=412). Out of 458 children, 5.6% (n=26) expired, 4.3% (n=20) left against medical advice. Average length of stay in PICU was 6.2 days Among the childrenin PICU, 16% (n=70) stayed for less than 3 days, whereas 84% (n=368) stayed for more than 3 days. Out of 110 children who were ventilated, 76.3% (84) were successfully extubated and discharged.

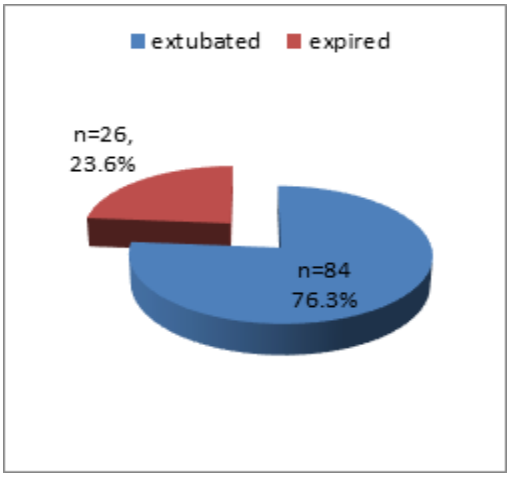

Figure 3: Ventilator outcome

Most common indication for ventilation was respiratory causes 52.7% (n=58), followed by seizures with status epilepticus which accounted for 44.5% (n=49). Most of the deaths were in the age group of 1 month-1yr which was 61.53% (n=16) followed by age group of 1-5yrs 26% (n=7) and it was 11% (n=3) in the age group of 6-12 years.

Among 26 deaths, 23%, n=6 were within 24 hrs, 34.6%, n=9 were between 1-3 days, and 42%, n=11 were beyond 3 days.

Table 3

Total Patients n=458	Outcome		p-value
	Survived	Expired	
Age			
1mth-1 year	172	16	P=0.26
1year-5yrs	153	7	
6yrs-12yrs	87	3	
Gender			
Male	260	17	P=0.81
Female	152	9	
Socioeconomic status			
Lower middle class	104	6	P=0.80
Lower class	308	20	
Residence			
Rural	362	20	P=0.36
Urban	70	6	
Ventilated(n=110)	84	26	
Stay in PICU			
<3 days	140	15	P=0.015*
>3 days	268	11	
Duration of Death			
<1day		6	
1-3 days		9	
>3days		11	

Table 3: gives the characteristics of children admitted to PICU in referencetoage, gender, socioeconomic status, residence, stay in PICU, Duration of death. There is statistically significant difference in outcome of children who stayed for less than 3 days in PICU compared to children stayed more than 3 days.

Discussion

Care of critically ill children has an important role in decreasing child death. PICU is a unit where critically ill children are admitted, managed with all point of care investigations. Pediatric intensive care needs well trained skilled staff personnel, vast usage of equipments, consumables, investigations and medications.Protocol based management, aseptic procedures, rational antibiotic policy are life lines of any PICU.

During our study period case record of 458 children admitted in PICU during January 2018-December 2018. Out of them 63.1%, n=289 were males and 36.9%, n=169 were females with a male female ratio of 1.7:1 similar to SarbaniMisraROY *et al* [4] where the ratio was 1.8:1 and 1.49:1 in a study conducted by Blessings Abhuhimen-Iyoha *et al* [5]. A Pakistani study conducted by AnwarHaque *et al* [5] also showed that male children contributed to the majority of admission which was 60.9% as compared to 63.1% in our study. Comparing the age group of children admitted in PICU, children under

five years contributed 67.15% in the study conducted by Sarbani Misra Roy *et al* [4] compared to 78.6% in our study. Under five year children contributed 72.45% in astudy conducted by Blessings Abhuhimen-Iyoha *et al* [5] and 62.5% by AnwarHaque *et al.*

The Disease patern of children admitted in various PICU varies. The most common system involved in PICU admission in our observation is Central nervous system 33.45%, Respiratory diseases accounted for 27.9% and poisoning 10%.

Most common causes of admission documented by SarbaniMisra *et al* [4]. central nervous system cases 26.61%, Respiratory cases were 23.8% and Gastrointestinal system cases were 13.1%. Anwarul Haque *et al* [6] also documented neurological cases 28% and respiratory cases 24.4%. I Blessing Abulimhen –Iyoha *et al* [5] reported cardiovascular diseases as the commenest in their study which accounted 41.1% cases.

The overall mortalityin our study is 5.6% whereas in a study conducted by Sarbhani Misra Roy [5] in West Bengal was 24.32% which was very high. Anwarul Haque *et al* [6] documented the mortality as 14% in their unit whereas I. Blessings Abhulimhen-Iyoha *et al* [5] reported only 2.1% mortality only.

Most of the deaths in our study were due to neurological disorders n=10 (38%) followed by Respiratory disorders n=7 (26.9%) whereas Arunkumar *et al* [11] documented more deaths due to Neurological disorders n=4 (38%) similar to our study. In our study we had poisoning as one of the common cause of admission which accounted for 10%, (n=46) of cases. All of them were accidental poisoning, the commonest being kerosene ingestion which accounted for 56.7% ofpoison cases whereas Arun kumar *et al* [11] showed only 8 poisoning cases which accounted for 1.9% of total admissions in PICU.

Conclusion

This study helped us to conclude that the pattern of sick children admitted in PICU s are not the same in all region and analysis of data of each PICU admission will help to strengthen the services provided by the PICU.Moreover such studies will help in devicing the protocols, prioritizing the resources on need basis and also to sensitise the primary care providers, field staffs, general public on early referral of critically ill children.

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