Original Article

Facility of Paediatric ICU

The Profile and Outcome of Children admitted in Paediatric Intensive Care Unit of a Public Hospital in Karachi

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ABSTRACT

Objective: To determine the profile and outcome of children admitted in paediatric intensive care unit of a public hospital in Karachi.

Study Design: Descriptive / Observational study.

Place and Duration of Study: This study was conducted at PICU of Civil Hospital Karachi from July 2013 to June 2014.

Materials and Methods: Data of the admitted patients was collected from the file records. It included demographic profile, admitting diagnosis, length of stay and outcome. Descriptive statistics were applied to describe the results.

Results: Overall 243 children were admitted in PICU during the study period. Among which 133 were admitted in 1st half and 110 during the later half of the year. 126 (51.85%) were male, whereas 117 were female. According to the age group, 91 (37.44%) were under 1 year where as 152 (62%) were more than 1 year among which 92 were between 1-5 years of age. Majority, 160 (67%) were admitted through emergency. Duration of stay in the hospital was varied, and 176 (72.42%) patients stayed for more than 24 hours, of these, 60 stayed for 3- 5 days. Upon admission, 83 (34.15%) needed ventilatory support. 16 (6.58%) children needed fluid boluses for resuscitation, whereas inotropic support was required by 49 (20.16%) children. Most of the cases i.e. 68 (27.98%) had respiratory illness as reason for admission. CNS diseases were present in 44 (18%) patients followed by sepsis/infection in 35 (14.40%) cases and Cardiovascular diseases in 22 (9%) cases. Out of total admission, 174 (71.60%) were shifted to the ward. Mortality was recorded in 59 (24%) cases, among which 40 occurred during 1st half of year and 19 during later half of the year, resulting in mortality of 30% in 1st half and 17% in 2nd half, respectively. Out of 59 expiries, 24 (40%) died within 1st 24 hours due to poor status at admission. Sepsis was the most common cause seen in 42 (71%) of non survivors. 7 cases were referred to other specialized centers for further management after initial stabilization, whereas 3 cases left against medical advice.

Conclusion: Respiratory system, central nervous system and infectious disease/sepsis were the commonest reasons for admission. PICU showed improved working in later half of year after its beginning.

Key Words: Paediatric intensive care, profile, outcome

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INTRODUCTION

Critical care provision through Paediatric Intensive Care Unit (PICU) is now recognized globally as an essential part of health services to seriously ill patients. It provides support to the vital organ's functions and has resulted in improved survival of sick children from various diseases which were previously considered fatal[1,2].

Pediatric critical care medicine (PCCM) has made great advancements over the last 3 decades in western world and is well established there but in developing countries it is relatively a new subspecialty which is still in infancy and there is paucity of knowledge about pediatric critical care[3,4].

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The current situation here is that there are a few PICUs in some private hospitals of big cities only. Public sector hospitals are almost devoid of it although they do receive a large number of seriously ill children who are managed in pediatric wards.

As a result, there are many studies documenting the outcome of patient of PICUs from developed countries[5,6], but few such studies are available from pakistan[7].

Seriously ill children coming to civil hospital Karachi (CHK) were managed in the pediatric wards before July 2013 when the PICU started working to take care of critically ill children.

Studies regarding the profile & outcome of PICUs are regularly done all over the world as a part of Continuous Quality Improvement (CQI), program in their performance[8].

This study was done to see the performance of PICU of CHK over one year period. It describes the demographic and clinical profile as well as outcome of

patients admitted in PICU of CHK, in order to determine which type of diseases in our children are to be focused more to provide improved quality of care in terms of treatment and prevention.

MATERIALS AND METHODS

All the patients admitted in PICU during the study period were enrolled. As per PICU admission policy, one month to twelve year old children were included, and surgical patients were excluded. Medical records of the admitted patients were reviewed. Permission was taken to utilize this data for research purpose from the concerned authority. Data included basic demographics, primary admitting diagnosis, admission source, length of ICU stay and out come. Descriptive statistics were used to express data in terms of number and percentages.

RESULTS

During the study period, 243 children were admitted in the PICU among which 133 were admitted during 1st half and 110 during the later half of year. 126 (51.85%) were male and 117 were females. Most of them, i.e. 152 (62%) were more than one year old. Out of these 92 were between 1 to 5 years age, 48 between 6 to 10 years age and 12 were more than 10 years old.

Majority 160 (67%) were admitted through emergency.

Regarding the length of ICU stay, total 176 (72.42%) patients stayed for more than 24 hours. Out of them 39 stayed for 48 hours, 60 stayed for 3-5 days, 44 stayed for 6-10 days & 33 stayed for more than 10 days.

Upon admission, 83 (34.15%) needed ventilatory support to maintain the oxygenation. 16 (6.58%) needed fluid boluses as part of initial resuscitation. Inotropic support was required in 49 (20.16%) patients inclusive of those who failed to improve upon fluid boluses only.

Most of the cases i.e 68(27.98%) had respiratory illness which included Bronchopneumonia, Acute Asthma, Lobar Pneumonia etc (Table I).

CNS problems were the second most which included Encephalitis, Bacterial meningitis, status epilepticus Etc (Table 2). Sepsis and infectious diseases were seen in 35 (14.40%) patients. There were 22 (9%) patients with cardio vascular diseases. 10 (4%) cases had diabetic ketoacidosis and 8 (3%) had acute poisoning. Remaining 56 (23%) were having miscellaneous problems.

Out of total admissions, 174 (71.60%) were shifted to ward upon improvement. 7 (2.8%) cases were referred to other specialized centers after initial stabilization, while 3 cases left against medical advice.

The remaining 59 cases (24%) were expired. Out of which 24 expired within first 24 hours of admission, indicating the severity of illness and poor status at the time of admission. Remaining 35 expiries occurred after 24 hours. Severe sepsis was the most common cause seen in 42 (71%) non-survivors. Other causes among them were fulminant hepatic failure, encephalitis, AKI, Steven Johnson Syndrome etc (Table 3).

During the course of their illness, 3 patients developed T.A.M.O.F. (thrombocytopenia associated multiorgan failure) which improved subsequently.

Table No.1: Pattern of respiratory illnesses

Disease	Numbers (n=68)	%age
Broncho pneumonia	24	35.29
Severe acute asthma	23	33.82
Lobar pneumonia	05	7.35
Bronchiolitis	02	2.94
Others (Including foreign body, plastic bronchitis, necrotizing pneumonia, pleural. effusion, collapse, laryngeal papilloma)	14	20.58

Table No.2: Pattern of CNS problems

Disease	Numbers (n=44)	%age
Encephalitis	18	40.90
Bacterial Meningitis	11	25
Status epilepticus	4	4.54
Tuberculous Meningitis	2	9.09
Guillain Barre Syndrome	2	4.54
Complex febrile fits	2	4.54
Brain abscess	1	2.27

Table No.3: Causes among non survivors (59)

Disease	Numbers (n=59)	%age
Severe sepsis (including bronchopneumonia etc.)	42	71.18
Fulminant Hepatic failure	5	8.47
Encephalitis	4	6.77
AKI	2	3.38
Steven Johnsons Syndrome	2	3.38
Myocarditis	2	3.38
Congenital Myasthenia Gravis	1	1.69
Brain abscess	1	1.69

Table No.4: Mortality Pattern during study period

	Number	%age
Overall mortality (among 243 cases)	59	24.28
Within 1st 24 hours of admission	24	9.87
After 24 hours	35	14.4
During July – December 2013 (among 133 cases)	40	30.0
During Jan – June 2014 (among 110 cases)	19	17.27

DISCUSSION

This study described the performance of PICU of a public sector hospital over one year period.

Annual audit of the PICU is an integral component of health planning and management to provide quality health care, as a part of Continuous Quality Improvement, (CQI) which is an ongoing process of evaluation and improvement[8].

The civil hospital Karachi, CHK in most part caters to lower & middle class from all over the province of Sindh, receiving a bulk of non affording poor patients, who are provided free of cost services.

PICU at CHK is a joint venture of dowites 86 and government of Sindh. It started working in July 2013 on public – private partnership basis. It is a 7 bedded intensive care unit of CHK, which is a tertiary care hospital. PICU receives patients from pediatric wards and from emergency room. Currently it is providing services to non-surgical cases only. The PICU is staffed by a paediatrician & postgraduates. Residents of fellowship program are regularly rotated from all the three paedaitric units of CHK. They are supervised by faculty members and senior paediatricians.

The nurse to patient ratio is 1:1. Admission age in PICU is 12 years and below based on existing hospital policy of admission in the pediatric department.

Initial days of working were difficult owing to insufficient staffing and other logistic problems and it was started with only two to three admissions at a time. On occasions, there were issues regarding co-ordination among various departments of the hospital, as many cases required multidisciplinary management. However, things were improved over time which is well reflected by comparing mortality during first and last six months (Table-4).

Approximately 37.44% i.e 91 patients were less than one year old, which was similar to age pattern noted in other studies of PICU in this region[1,9].

Contrary to other studies, male predominance in admissions was not seen[10].

Majority of diseases requiring PICU admission were related to respiratory system which is similar to other regional studies[11,12].

Children having respiratory distress, acute neurological deterioration, severe infections/sepsis, cardiovascular compromise, and accidental poisoning constitute the major admission to a pediatric intensive care unit[11].

Similar to other regional studies, majority of diseases requiring PICU admission were related to respiratory system, central nervous system and infectious diseases/sepsis[1,12].

Among respiratory problems, bronchopneumonia and severe acute asthma were the commonest.

Encephalitis and meningitis were commonest among central nervous system diseases to be managed in PICU.

Seven patients had to be referred to specialized centers after initial stabilization while 3 patients left against medical advice due to domestic reasons including lack of person for caring of other children at home.

Out of total 59 expires, 24 (40%) died with in 1st 24 hours of admission indicating the severity of illness and poor status at the time of admission.

Remaining 35 (59.32%) deaths occurred after the 1st 48 hours. In this particular population, the development of MODS (Multi organ dysfunction syndrome) was universal, irrespective of the underlying etiology.

MODS is as much a therapeutic challenge in Pakistan as in other regional countries like India and Srilanka[16].

Severe sepsis was the most common cause among non-survivors. Mortality in the 1st six months of year was 30% which decreased to 17% in the second half of year. Overall mortality was 24.28% which was comparable to few PICU studies of the country showing mortality in the range of 22-29[7,13].

As part of CQI implementation program to provide quality health care to our children the following steps should be taken.

There is a need for a full time paediatirc intensivist along with more nursing staff. Several reports have shown that full time trained critical care specialists in ICUs improve the quality of care and are associated with lower mortality rates[1,17].

Mortality was decreased to 14% in private hospital PICU in Karachi when a full time paediatric intensivist was appointed[9].

There is evidence that supports better out come of PICU patients in tertiary centers, which led to the development of a centralized system of PICU world wide, [17] same things is required here.

Better intra hospital coordination among various departments is needed to decrease the referral rate and to decrease mortality due to hospital errors.[19]

Although the concept of Pediatric critical care is relatively new in Pakistan, implementing a Paediatic critical care fellowship programme is the emerging need of the day. This sub speicality should be recognized in the country on urgent basis, to generate pediatric intensivists locally according to the needs.

This PICU proved to be an excellent model of public-private partnership providing maximum health support to the less privileged ones. Similar models can be replicated in other cities of the country.

The PICU further needs to be improved to cater trauma and surgical cases also. Trauma is common in children and in few studies surgical admissions were almost equal to medical admissions or even greater, where majority of admissions were from operating room.[7,9,20]

CONCLUSION

Study showed improved progress during the later half of year, yet there are many miles stones to achieve & maintain as pointed out under CQI implementation.

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