

Clinical Profile and Outcome in a Paediatric Intensive Care Unit in Pakistan

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ABSTRACT

Aim: To study was to analyze demographic profile and outcome in a tertiary care hospital PICU in Multan Pakistan.

Methods: This prospective study was carried out in Children Complex Hospital, Multan from January 2011 to June 2014. A total of 1573 patients were admitted during the period.

Results: Out of total admissions 980(63%) were boys and 593(37%) were girls. The patients were admitted from medical emergency (60%), surgical emergency (10%), medical ward (18.6%), surgical ward (1.16%) and from operation theatre (10%). Mechanical ventilation rate was 473(27.8%). Three hundred patients died in PICU given a mortality rate of 19.07%. Patients admitted from hospital pediatric wards as internal patients had higher mortality rate compared to the patients taken from emergency department and operation theatre. The mean age was 18 months (ranging from 1 day to 14 years) and 42% (660/1573) were less than one-year old. Emergency medical admissions were 1240(78.8%) and surgical admissions were 333(21.1%). Majority of the patients 1101(70%) had severe malnutrition below the 5th percentile for weight for age. Patients who died had statistically worse severity scores. Significant mortality risk factors were high inotropic score and PRISM III-24>8.

Conclusions: Demographic profile of our PICU patients showed similar characteristics as those of reported in different relevant studies with minor differences in few aspects. The overall results of this study are encouraging and development of new PICUs in our country is the need of the day.

Keywords: Pediatric intensive care unit, pediatric risk of mortality PRISM III-24, mortality.

INTRODUCTION

Pediatric Intensive Care Unit (PICU) has developed a very vital role in the treatment and management of extremely ill and injured infants and children. The goal of PICU is the surveillance and support of vital organ function in critically-ill or injured children who are at risk for organ dysfunction¹. Children are the most precious beings in our lives, but they are very fragile and easily succumb to disease and can have life threatening attacks in minutes.

Advances in knowledge and technology of medical science have dramatically improved the prognosis for the critically-ill children. . Pollack et al showed a better outcome of PICU patients in units where there was a pediatric intensivist and/or a pediatric intensive care fellowship programme². Numerous conditions that were previously fatal are now treatable. Moreover, there are references that support better outcome of PICU patients in tertiary centers, which led to the development of a centralized system of PICUs worldwide^{3,4,5}. The specialty of pediatric critical care medicine has progressed and developed over 30 years in the

developed countries⁶. There are several reports on the outcome of PICUs from developed countries, but only few reports are available from Pakistan^{7,8,9}. Significant numbers of critically ill children need to be transferred between hospitals supported by a well organized transfer system that guarantees the safety of the patient and the quality of the transfer¹⁰. Aim of this study was to study the clinical profile of children admitted to the pediatric intensive care unit of Children Hospital & The Institute of Child Health Multan to find the disease distribution and the age distribution and the mortality rates.

MATERIAL AND METHODS

This prospective study was carried out in Children Complex Hospital, Multan from January 2011 to June 2014. A total of 1573 patients were admitted during the period. Further distribution of admission was that the patients were admitted from medical emergency (60%), surgical emergency (10%), medical ward (18.6%), surgical ward (1.16%) and from operation theatre (10%).

RESULTS

Among 1573 consecutive patients admitted in the above time period, 980 (63%) were boys and 593 (37%) were girls. Out of the total cases 1240 (78.8%)

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were medical cases and 333(21.2%) were surgical cases.

Mechanical ventilation rate was 473(27.8%). The mean PRISM III score was 13.2 (4-36). The average length of PICU stay was 4.5 (ranging from 1 to 271) days. Three hundred patients died in PICU given a mortality rate of 19.07%. Patients admitted from hospital pediatric wards as internal patients had higher mortality rate compared to the patients taken from emergency department and operation theatre.

Concerning the mode of death, the majority died from brain death due neurological problems (23.33%) including head trauma (22), central nervous system (CNS) infection (42), status epilepticus (8). Seventy five patients (25%) died from septicemia and multiple organ failure syndrome (MOFS); 35 patients (11.66%) died due to LRTI. Twelve patients (4%) died from intractable cardiac arrest and failed cardiopulmonary resuscitation (CPR) due to cardiac causes including acute myocarditis, complex congenital heart disease and dilated cardiomyopathy. Infancy, source of admission, diagnosis at admission, co morbidities, presence of syndrome, prior hospital or NICU admission, gastric ulcer prophylaxis, corticosteroid use, acute renal failure and weren't found to be significant risk factors. Only the severity of the disease (PRISM III-24 score) and high inotropic score were found to be important independent predictors of mortality.

The mean age was 18 months (ranging from 1 day to 14 years) and 42% (660/1573) were less than one-year old. Majority of the patients 1101(70%) had severe malnutrition below the 5th percentile for weight for age. The major diagnostic categories of medical patients were neurological 370(23.5%), respiratory 277(17.6%) and cardiac 115(7.3%) endocrinological 107(6.8%), hematological 70(4.4%). The bed occupancy rate was 94%. Four hundred and thirty seven patients (27.8%) received mechanical ventilation, while more than 50% received vasoactive drugs. There were 300 deaths giving overall mortality of 19.07%.

Table-1: Patient characteristics

Variables	Numbers
Admissions	1573
Mean age (months)	18 months
Age less than one year	660 (42%)
Males (%)	980 (63%)
Females (%)	593 (37%)
Medical admissions	1240 (78.8%)
Surgical admissions	333 (21.2%)
Mean PRISM111 Score 13	13
PICU length of stay(days) average	5.4
Mortality (%)	19.07

DISCUSSION

We presented the demographic profile and the outcome of Pakistan public sector PICU patients, illness severity and treatment characteristics and the investigation of relative mortality risk and possible outcome prediction factors. Paediatric intensive care medicine is a relatively new sub-specialty in Pakistan and especially in Multan. Recently, there has been increase in health awareness which lead to the establishment of PICU in The Children Hospital and The Institute of Child Health Multan. An important observation to notice was that the severity of critical illness at presentation and high inotropic score were independent predictors of PICU mortality.

Our population had a mean age of (18 m) and the proportion of infants (42%) was much higher than the reference values of mean age (3-6 yrs or 36-72 m) of PICU patients¹¹. Haque et al also showed a close mean age range of 24 months¹². The preponderance of male sex (63%) was somehow higher than the relevant values of 54-2%¹³, and rather uniform in all diagnosis. This value was closer to the male sex value of 66% reported by Haque et al¹². The majority of admissions were medical emergencies (78.84%), and 21.2% were surgical emergencies. This is in accordance to the associated studies where surgical patients represent a big proportion of PICU patients ranged from 16-60%¹⁴. Haque et al showed an almost equal distribution of medical admissions (46%) and surgical admissions (54%)¹². In contrary, it is showed 92.3% medical emergency cases and only 7.7% surgical postoperative cases²⁶. Additionally, trauma patients in our unit (17.2%) were higher than the reference values of 6.5-11.5%¹⁵. Even higher no of trauma patients (22.3%) were reported by Volakli et al¹⁶. Mechanical ventilation (27.8%) approximated the lower reference values of 31.5-67%^{17,18} while the majority of our patients (62%) were already mechanical ventilated at admission. In contrast 90% of patients received mechanical ventilation in a study reported by Haque et al, which is surprisingly very high.

Very few studies are available showing the statistics and characteristics of PICUs from Pakistan. The reported mortality rate was 22-29% in different studies and the rate of nosocomial blood stream infection was reported as 15%. The overall mortality rate in this setting was 19.07% and comparable to other reported PICU studies from India and Malaysia, which ranged from 12-18%¹⁹. The nosocomial infection in our PICU was only 12%, which is still high and most likely due to non-compliance with infection control measures. Haque et al showed a mortality rate of 14% and nosocomial infection rate of 4.7%¹².

These relatively low figures show their improved patient care and infection control techniques.

Different studies have proved that full-time trained critical care specialists in both adult and paediatric ICUs improve the quality of care and are associated with lower mortality and morbidity rates³¹. Our study also shows similar findings. There was marked reduction in mortality, shorter length of stay and increase efficiency of our PICU since implementation of full-time trained paediatric intensivist. In Pakistan, the process of establishment of new PICU,s in very slow and more so the number of trained Paediatric Intensivists is also very short. Most of the PICUs still have no intensivist in Pakistan. The age and gender characteristics of these patients were similar to that noted in the studies done in other PICUs in this region. Majority of the patients were medical emergencies as compared to western PICU, where majority of admission is from operating room. This study was a reflection of public sector which represents a more realistic picture.

CONCLUSION

Demographic profile of our PICU patients showed similar characteristics as those of reported in different relevant studies with minor differences in few aspects. The overall results of this study are encouraging and development of new PICUs in our country is the need of the day.

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