

Admission Pattern and Outcome in a Pediatric High Dependency Care (PHDC) Unit of a Tertiary Care Children Hospital in Bangladesh.

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Abstract

Pediatric high dependency care (PHDC) is a care comprising of close observation, monitoring and management of children who are vulnerable to physiological instability. To determine the pattern of admission and register outcome of patients in the pediatric high dependency care (PHDC) of Dhaka Shishu (Children) Hospital, a tertiary level referral children hospital in Bangladesh. This is a retrospective study of the record of patients admitted to the PHDC unit at the Dhaka Shishu Hospital from May 2015 to February 2016. The information obtained from the admission/discharge record as well as the patients' case notes included demographic data, working diagnosis, type of management, length of stay (LOS) in the PHDC unit and outcome. A total of 140 children were admitted during the study period comprising of 80 (57.15%) males and 60 (42.85%) females, giving a male : female ratio of 1.33:1. The age ranged from one day to 12 years with a mean of 35.44±3.1 months. Meningitis (both bacterial and viral) accounted for 24 (17.14%) followed by encephalitis, 21 (15%) were the major indications for admission. Other indications included seizure disorders (both febrile and afebrile), 18 (12.85%); bronchopneumonia including acute bronchiolitis, 15 (10.71%); neonates with different indications 13(9.28%); typhoid fever with complications 5 (3.57%); mumps with complications, 4(2.85%); chickenpox with complications, 3(2.14%) ; surgical conditions, 7 (5%), and others, 30(21.42%). There were no post-operative surgical cases. The length of stay (LOS) in the unit ranged from 1 day to 34 days with a mean of 7.9±0.5 days . The treatment expenses ranged from 1000 BDT to 50,000 BDT with a mean of 12297.14± 888.69 BDT. Out of total 140 admissions, 82 (58.57%) were discharged in a satisfactory condition; discharge on request (DOR), 30 (21.42%); referred to intensive care unit (ICU), 7 (5%); left against medical advice (LAMA), 15(10.71%) and death, 6 (4.2%); case fatality rate (CFR), 4.2/100 admission. Among the death cases there were 2 meningitis, 2 encephalitis, 1 acute bronchiolitis and 1 preterm very low birth weight (VLBW). Meningitis, encephalitis, bronchopneumonia, seizure disorder were the major causes of admission in PHDC unit, while case fatality was the highest for meningitis and encephalitis. Therefore, awareness regarding prevention, early detection and management of meningitis and encephalitis should be emphasized.

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Introduction

The PHDC is a provision of close observation, monitoring and therapies to children who are potentially physiologically unstable and demand management beyond the capacity of general pediatric care¹ (NHS Commission Board 2013). It is a level-2 care between PICU which is a level-3 or above care and POU which is a level-1 care. The general pediatric ward or acute hospital ward is a level 0 care² (ICS level of care, 2003).

Children with acute neurological disorders, acute respiratory distress, acute compromised cardiovascular status, severe infections with complications and accidental poisoning

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constitute the bulk of admission in a PHDC unit³. Patients are discharged with advice if they are satisfactorily recovered. Patients may either be transferred from PHDC unit to POU or general pediatric ward if the disease process reverses and further care may be provided⁴ or they may be transferred to PICU if condition deteriorates within 24 hours.

The disease-pattern in PHDC unit particularly in early age group is a sensitive indicator of the availability, utilization and effectiveness of mother and child health services in the community. The disease-pattern varies in different places and even in the same place time to time⁵. Therefore, regular review of the disease pattern in any particular setting is important for providing better services to the patients.

We conducted this study to document the number, disease-pattern and outcome of patients admitted to our PHDC unit of Dhaka Shishu(children) hospital. This may help to assist health workers and planners to pay due attention for better utilization of health care facilities because better understanding leads to better management.

Methods

This retrospective study was conducted in the PHDC unit of Dhaka Shishu(children) hospital, the largest tertiary care pediatric hospital in Bangladesh with 640 beds in the inpatient department and all subspecialties in pediatric medicine and pediatric surgery. The PHDU has 15 beds and operates in full capacity round the clock. A trained consultant pediatrician, an intensivist and residents are responsible for medical care of the PHDU patients.

Study population

A retrospective study was conducted from the record of the patients admitted to the PHDC unit at the Dhaka Shishu(children) hospital over a period of 8 months (July 2015 to February 2016).

Data collection

Information regarding admission and outcome were obtained from PHDC unit hospital record forms. The hospital record forms consist of admission/discharge record as well as the patients' case notes including demographic data, working diagnosis, type of treatment, length of stay (LOS) in the PHDC unit and outcome.

Statistical analysis

The data were subjected to statistical analysis according to standard procedure. SPSS version 21.0 for Windows (SPSS Inc, Chicago, IL, USA) software was used for data recording and analysis. Basic descriptive statistics were produced, with the mean (standard deviation) and median used as measures of central tendency.

Ethical issues

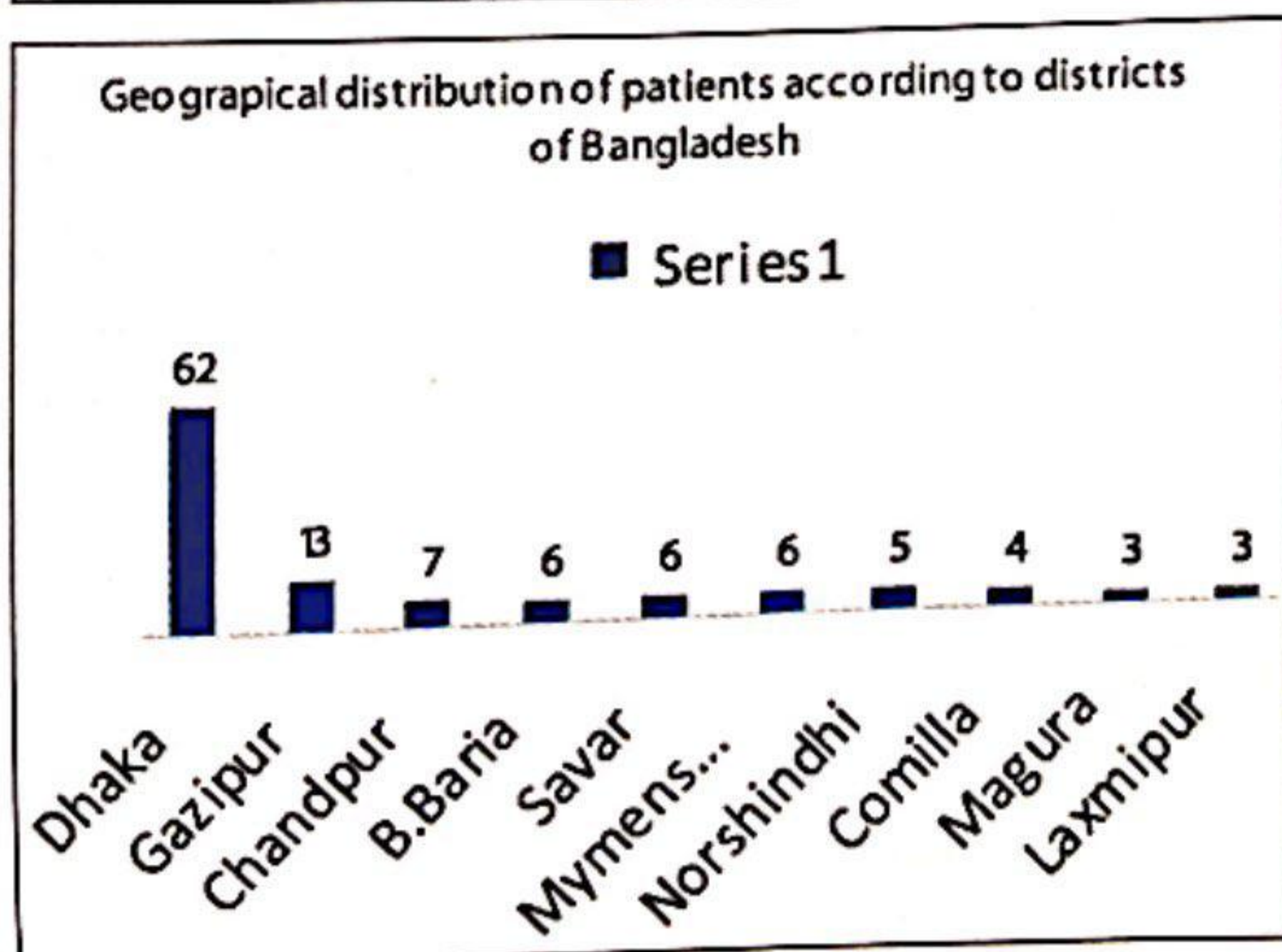
A permission to conduct this study was obtained from Dhaka Shishu(children) hospital ethical review committee.

Results

A total of 140 children from all the districts of Bangladesh were admitted over the study period which comprised of 80 (57.15%) males and 60 (42.85%) females, giving a male : female ratio of 1.33:1. The age ranged from one day to 12years with a mean of 35.44±3.1 months. Meningitis (both bacterial and viral), accounted for 24 (17.14%) of all admissions followed by encephalitis, 21 (15%) were the major indications of admission. Other indications included seizure disorders(both febrile and afebrile), 18 (12.85%); bronchopneumonia including acute bronchiolitis, 15 (10.71%); very low birth weight (VLBW), perinatal asphyxia (PNA) with different stages of hypoxic ischemic encephalopathy (HIE) , neonatal jaundice, neonatal sepsis 13(9.28%); typhoid fever with complications 5 (3.57%); mumps with complications, 4(2.85%); chickenpox with

complications, 3(2.14%) ; surgical conditions, 7 (5%), and others, 30(21.42%), including GBS, acute stroke syndrome, brain tumour, syringomyelia, Steven Johnson syndrome, erythema multiformes, Surge Weber syndrome, UTI, Hepatitis, HSP, dengue fever, congenital heart disease, ichthyosis, metabolic disorders ,Syndromic baby. There were no post-operative surgical cases. Most of the patients were from Dhaka district (62), followed by Gazipur (13), Chandpur (7), Brahmanbaria(6) and others. The length of stay (LOS) in the unit ranged from 1 day to 34 days with a mean of 7.9 ± 0.5 days . The treatment expenses ranged from 1000 BDT to 50,000 BDT with a mean of 12297.14 ± 888.69 BDT. Out of total 140 admissions, 82 (58.57%) were discharged in satisfactory condition, DOR 30 (21.42%) referred to ICU for further management, 7(5%), LAMA, 15(10.71%)and death 6 (4.2%). CFR, 4.2/100 admission. Among the death cases there were 2 meningitis, 2 encephalitis, 1 acute bronchiolitis and 1 preterm VLBW.

| Age | Male n(%) | Female n(%) | Total n(%) |
|-------------------|-----------|-------------|------------|
| 01days-28days | 9 | 4 | 13(9.3%) |
| 01month-12months | 29 | 21 | 50(35.7%) |
| 13months-60months | 26 | 23 | 49 (35.0%) |
| >60 months | 16 | 12 | 28 (20.0%) |
| | 80 | 60 | 140(100%) |



Discussion

Pediatric high dependency unit is a new addition in the arena of pediatric critical care in Bangladesh. Recently, there has been an increase in health-awareness among general population which increased the demand of critical care support. Hence PHDC can be useful by providing the critical care support to those with a single organ failure and with a better outcome than level-1 care and can provide cost-benefit compared to that of level 3 care. In Bangladesh, there is scarcity of advanced equipment and sometimes few of these equipment are out of order with poor maintenance. The concept of biomedical engineering is totally missing. There is also lack of trained personnel. There is also limitation of infra-structural, and financial resources.

There are very limited studies in our country on PHDU, and also few in the developed countries which makes difficult to compare PHDU patients with that of general pediatric population. As we have very limited numbers of PHDU in our country it is not very feasible to make a comparison between them. A recent review highlighted the paucity of knowledge regarding critical care in the developing countries. Knowledge of the characteristics and outcomes of critically ill pediatric patients admitted to PHDUs in developing countries is essential to identify priorities.

This retrospective study was conducted in order to document the disease-pattern and outcome demanding critical care in the PHDU of Dhaka Shishu Hospital. A total of 140 children were admitted during this period among whom 13 were neonates, 50 were below 12 months, 49 were 12 to 60 months, 28 were more than 60 months. The age and gender characteristics of these patients were similar to that noted in studies done in other PHDU and PICUs in this region. Meningitis (both bacterial and viral), accounted for 24 (17.14%) followed by encephalitis, 21 (15%) were the major indications of admission. Other indications for admissions included seizure disorders(both febrile and afebrile), 18

(12.85%); bronchopneumonia including acute bronchiolitis, 15 (10.71%); neonates with different indications 13(9.28%); typhoid fever with complications 5 (3.57%); mumps with complications, 4(2.85%); chickenpox with complications, 3(2.14%) ; surgical conditions, 7 (5%), and others, 30(21.42%). The patterns of diagnoses in our study are different from a similar study done in Chittagong, Bangladesh⁶. But our study may not reflect the true number of severe cases who seek care in this hospital because many patients choose not to come to PHDU for financial constraints. Due to scarcity of PHDU beds the admission is prioritized based on the need of critical care. The overall case fatality rate (CFR) is 4.2/100 admission. The reported mortality rate at Dhaka Shishu Hospital PHDU was lower than that of other PHDUs in Bangladesh and also lower in comparison to the PICUs in both home and abroad^{3,6,7,8,9,10}.

The median stay in the PHDU was 7.9±0.5 days. This median is similar to that of PICU reported in different centers but could not be compared with other PHDUs as data were not available⁷. A study from the UK has shown that around 28% of children who are admitted to PICUs do not require invasive (delivered via an endotracheal tube) or non-invasive (delivered via facemask or other device) ventilation. Most of these children can be managed in a critical care environment outside PICU if appropriate resources are available¹¹. Thus treatment expenses can be curtailed with provision of good PHDU with maximum patient care. Most of the PHDU still have no intensivist in Bangladesh.

This study was a reflection of private sector rather than public sector which represents a more realistic picture and authors acknowledge this limitation.

Conclusion

Meningitis, encephalitis, seizure disorder, bronchopneumonia were the major causes of admission in HDCU in our study, while meningitis and encephalitis was the major cause of death. Infection remains a major

problem for patients in PHDC units (PHDC) and is associated with considerable morbidity, mortality and direct cost to the patient and indirect to the hospital by way of hospital acquired infection. Therefore, early care seeking and management can lead to reduction in number of serious cases requiring PHDU care and thus can reduce morbidity and mortality in children. This can be achieved by proper and effective community awareness and appropriate referral.

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