CLINICAL AUDIT OF NEONATAL ADMISSIONS IN A TERTIARY CARE HOSPITAL

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Background: Neonatal mortality and morbidity is always a great concern for clinicians and public health experts. **Objectives**: To determine the disease pattern and outcome in neonatal unit of Sheikh Zayed Hospital, Rahim Yar Khan. **Patients & Methods:** This prospective study was conducted in the neonatal unit of Sheikh Zayed Medical College /Hospital, Rahim Yar Khan from 1st January to 31st December 2010. The data of all the neonates admitted during the study period was analyzed regarding diagnosis, outcome (discharge, discharge on request, left against medical advice, death) and death cases were evaluated in detail regarding sex of patient, place of delivery and mode of delivery. **Results:** A total of 17150 patients were admitted in pediatric unit of which 4214 (24.6%) were neonates. Birth asphyxia was the commonest cause of admission in 1610 (38.2%) patients, followed by prematurity & low birth weight 1052 (24.9%), sepsis 631 (14.9%), congenital malformations 435 (10.3%), neonatal jaundice 225 (5.3%), meconium aspiration syndrome 181 (4.3%) & miscellaneous 80 (1.91%). Total Paediatric deaths were 1651 with neonatal deaths 1030 (24.4%) while post-neonatal deaths were 621 (4.8%). Main bulk of mortality was observed in first 7 days of life in 794 (77%). The commonest cause of mortality was prematurity with its complications in 470 (45.6%) deaths, followed by birth asphyxia 302 (29.3%) and sepsis 191 (18.5%). Of the total expired patients 405 (39.3%) were delivered in Sheikh Zayed Hospital, 385 (37.4%) at home, while 240 (23.3%) in private clinics & hospitals. **Conclusion:** Birth asphyxia, prematurity, low birth weight, sepsis, & congenital malformation are the main causes of neonatal admissions, while common causes of mortality are prematurity followed by birth asphyxia & sepsis. Solid & sustainable policies need to formulated & implemented to avoid the various preventable causes of neonatal morbidity & mortality.

Key words : Neonates, Asphyxia, Prematurity, Sepsis, Mortality

INTRODUCTION

Worldwide, 130 million infants are born each year, of these, 4 million die in first 28 days of life.[1] Neonatal period (1st 28 days of life) is the most fragile and vulnerable period of life because of the large number of problems & diseases which a neonate is likely to face. Approximately 70-75% of neonatal deaths occur in the first week of life and of these, more than one quarter occurs in the 1st 24hrs. Neonatal mortality accounts for 40% of all the deaths under the age of 5 years world wide.[2] Though there has been a global decline in under five and infant mortality rates in recent decades yet neonatal mortality has remained relatively unchanged in developing countries.[3]

Two third of the world's total neonatal deaths occur in just 10 countries, mostly in Asia. Pakistan is number three among these. With a reported neonatal mortality rate of 49 per 1000 live birth, Pakistan alone accounts for 7% of global neonatal deaths.[4-6] Infections (36%), prematurity (28%) and birth asphyxia (23%) account for 87% of neonatal deaths worldwide.[7] Since causes of neonatal deaths vary from country to country and with the availability and quality of health care, understanding neonatal mortality in relation to these factors is crucial.[8] Majority of newborn babies do not develop any serious problem or difficulties and require only minimal care, which can be provided by the mother if properly supervised by a health worker. However, high-risk mothers are likely to give birth to asphyxiated, premature or low birth weight babies who are prone to suffer a large number of short & long term problems. According to UNICEF, in Pakistan 500 neonates die daily, making death at least once every four minutes. UNICEF's State of the World's Children Report (SOWC), launched in Islamabad on 15 January 2009, an estimated 216,000 Pakistani newborns die each year before they are one month old.[9] This group represents 58 percent of deaths among children under five. Pre-maturity alone accounts for majority of high risk newborns as they are likely to face a large number of problems.[10] Majority of the causes of neonatal morbidity and mortality in our country are preventable. The lack of obstetrical and neonatal services, poor infrastructure of primary health care, low awareness of the health needs of pregnant women, and poor status of women are contributory factors. This study was carried out in

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neonatal unit of Sheikh Zayed Hospital/college, Rahim Yar khan which is located in southern Punjab and caters a large population of southern Punjab, areas of Sind & Baluchistan province, where the provision of health care services are still meager. This descriptive study was conducted to know the various patterns of diseases in neonates admitted in our hospital and to determine the causes of neonatal mortality.

PATIENTS & METHOD

This descriptive study was based on retrospective analysis of the record of all patients admitted in neonatal unit of Sheikh Zayed Hospital Rahim Yar Khan from 1st January 2010 to 31st December 2010. The data was collected regarding diagnosis and outcome of all the admission during study period (discharge, discharge on request, left against medical advice, death). The record of death cases was further evaluated in detail regarding age of patients, sex of patient, place and mode of delivery. Diagnoses were made mainly on clinical grounds & based on WHO case definition e.g. prematurity (live born neonate delivered before 37 weeks from 1st day of last menstrual period & low birth weight (LBW) having a birth weight of less than 2.5kg. Sepsis was suspected on clinical grounds and was confirmed by relevant investigations. Birth asphyxia was diagnosed on clinical grounds, and Congenital heart disease was confirmed by echocardiography.

RESULTS

Total patients admitted in pediatric unit in year 2010, were 17150 & total neonates were 4214 (24.6% of the total admission). The pattern of neonatal diseases in admitted cases was birth asphyxia in 1610 (38.2%), prematurity & low birth weight in 1052 (24.9%), Sepsis in 631 (14.9%), congenital malformations (congenital heart diseases, spinal dysraphism and other congenital anomalies) in 435 (10.3%), neonatal jaundice in 225 (5.3%), meconium aspiration syndrome in 181 (4.3%) & miscellaneous in 80(1.9%) (Table I). Out of the total neonatal admissions, 2800 (66.44%) were discharged in satisfactory condition, 154 (3.65%) were discharged on request, 230 (5.45%) left against medical advice (LAMA) and 1030 (24.44%) expired. The total deaths in pediatric unit were 1651 with an overall mortality rate of 9.62%. Out of these, neonatal deaths were 1030 & post neonatal deaths were 621.

Out of the total neonatal deaths, 695 (67.5%) were males while 335 (32.5%) were females. Mortality was 77% (794) in first 7 days of life & 23% (236) in 8 to 28 days of life. Mortality in first 7 days of life was 66% in male & 34% in female babies. Mortality in 8-28 days of life was 53% in male & 47% in female babies. The cause for mortality in 470 (45.6%) neonates was Prematurity with complications, prematurity with sepsis in 174(16.9%), prematurity with asphyxia in 156(15.1%), prematurity with respiratory distress syndrome in 60(5.8%), prematurity with small for gestational age in 57 (5.5%), prematurity with congenital malformations in 18 (1.75%), prematurity with intra cranial hemorrhage in 5(0.48%), asphyxia in term neonates in 302 (29.3%), sepsis in term neonates in 191 (18.5%), meconium aspiration syndrome in 25 (2.4%), congenital malformation in 21 (2.04%), Tetanus in 7 (0.68%), Intracranial hemorrhage in term neonates 03 (0.29%) and miscellaneous in 11 (1.1%). Out of the total expired patients, 405(39.3%) were delivered in Sheikh Zayed Hospital, 385 (37.4%) delivered at home, 240 (23.3%) delivered in private clinics & hospitals. 748(72.6%) expired patients were delivered by normal vaginal delivery and 282 (27.8%) via cesarean section.

Table I: Pattern of admission and outcome of neonatal admission

Pattern of Neonatal Admissions							
Disease	Birth Asphyxia	Prematurity & LBW	Sepsis	Congenital Malformations	Neonatal jaundice	MAS	Miscellaneous
No. of patients (%age)	1610 (38.2%)	1052 (24.9%)	631 14.9%)	435 (10.3%)	225 (5.3%)	181 (4.3%)	80 (1.91%)
Outcomes of neonatal admissions							
Discharged		**Discharged on Request**		**LAMA**			**Deaths**
2800 (66.4%)		154 (3.65%)		230 (5.45%)			1030 (24.44%)

Figure I: Place of delivery of Expired Neonates

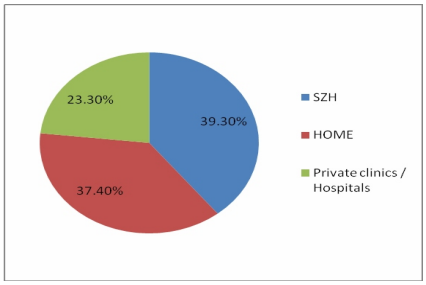

Table II: Causes of Neonatal Mortality

1) Prematurity: 470 (45.6%)	
Prematurity with sepsis	174 (16.9%)
Prematurity with asphyxia	156 (15.1%)
Prematurity with RDS	60 (5.8%)
Prematurity with small for gestational age	57 (5.5%)
Prematurity with Cong. Malformations	18 (1.75%)
Prematurity with ICH	05 (0.48%)
2) Birth asphyxia	302 (29.3%)
3) Sepsis	191 (18.5%)
4) (Meconium Aspiration Syndrome) MAS	25 (2.4%)
5) Cong. Malformations	21 (2.04%)
6) Tetanus	07 (0.68%)
7) Intracranial Hemorrhage (ICH)	03 (0.29%)
8) Miscellaneous	11 (1.1%)

DISCUSSION

Of the 130 million infants born each year worldwide, 10.7 million die before celebrating their 5th birth day. Among these deaths 4 million die during the first four weeks of life while another 3.3 million are stillborn.[11,12] The highest neonatal & perinatal mortality rates occur in sub-Saharan Africa, followed by Asia and Latin America. In countries where the childhood mortality is highest, almost 10 percent of babies do not survive more than one month.[11] In spite of the recent trends of global decline in under five and infant mortality rates in last few decades, neonatal mortality still remains relatively high probably because of poor obstetrical and neonatal health services. Our study exactly reflects the above mentioned scenario because neonatal mortality was higher in relation to post-neonatal mortality, 24.4% in the neonatal and 4.8% in the post-neonatal age group. Neonatal mortality in our unit is higher as compared to study conducted in Peshawar[13] (14.87%), while less as compared to studies conducted in Lahore[14] (34%) and in Karachi[15] (25.8%).

Many factors are believed to be responsible for high neonatal mortality particularly in under-privileged countries like Pakistan. Sheikh Zayed Hospital/college, Rahim Yar khan is located in southern Punjab. The majority of the people of all these areas have low socioeconomic status, low literacy rate especially among females & inadequate antenatal services. This worse scenario is further compounded by the late referral of pregnant women & problematic newborns to tertiary care hospital resulting in critical condition of neonates at the time of admission. Another important factor for this high mortality is shortage of present working staff including consultants, duty doctors & trained nursing staff which is not sufficient to cope with heavy workload. Recent reports from Pakistan and other poor resourced settings indicate that substandard care, inadequate training, low staff competence and a lack of resources, including equipment and medication, are all factors that contribute to neonatal deaths.[16,17] It has been recognized that more than 50% newborn deaths can be prevented by interventions such as improving the maternal health & antenatal services, tetanus toxoid immunization to mothers, clean and skilled care at delivery, improved newborn resuscitation, exclusive breastfeeding, clean umbilical cord care & management of infections in newborns.[18]

Globally various common causes of neonatal mortality are prematurity with its complications, birth asphyxia, sepsis & severe congenital malformations. The proportion attributable to each cause varies from center to center. In areas where neonatal mortality is lower, prematurity and malformations play a larger role, while at places where mortality is higher, the contribution of asphyxia and infections is greater.[11]

The commonest cause for mortality in our study was prematurity with its complications (45.6%) mainly sepsis followed by asphyxia, respiratory distress syndrome, intracranial hemorrhage, low birth weight and congenital malformations. Prematurity as a major cause of mortality in our study is very much comparable to other studies conducted in various other parts of the country and in other developing countries[19,20]. Birth asphyxia in term babies accounted 29.3% and 15.1% in preterm babies making 44.4% as second major cause of mortality. Sepsis as a whole was third major cause of mortality in our study because sepsis in full-term neonates and sepsis in pre-term accounted collectively for 35.4% deaths, the results are similar with other studies[22,23] stressing infections/sepsis as important cause of mortality. These results are consistent with WHO

reports on the causes of neonatal death in developing countries and also with other reports from Pakistan. [3,5,6,8.24]

The first week of life being the transitional period from intrauterine to extra uterine life is considered to be the most fragile & vulnerable period, hence most of the deaths are likely to occur in the first week of life. In our study, 77% neonatal deaths were in first 7 days of life with male to female ratio 2:1 & rest of the 23% in 8-28 days of life with male to female ratio 1.1:1. These results are comparable to many other studies.[8] There were more male deaths (66% male & 34% female) in the early neonatal period, a finding consistent with the well described biological survival advantage of girls in the neonatal period. In contrast, there were relatively more female deaths in the late neonatal period (47% as compared 34%), it might be due to gender bias of reduced care-seeking for girls compared with boys which has been reported in several settings, especially in south Asia.[25] Of the expired neonates majority (39.3%) were delivered in SZH (tertiary care hospital) followed by 37.4% at home & 23.3% in private clinics/hospitals which is different from many other studies where most of neonatal mortality is reported from deliveries conducted outside tertiary care hospital. This point again suggests poor antenatal care and late referral of pregnant women at the time of delivery to tertiary care hospital resulting in poor outcome of even hospital delivered babies.

CONCLUSION

Birth asphyxia, prematurity, low birth weight, sepsis, & congenital malformation are the main causes of neonatal admission while common causes of mortality are prematurity followed by birth asphyxia & Sepsis. Another important thing is to create awareness among all the health workers dealing with the pregnant women for timely referral of high risk pregnancies, also be aware of condition of baby when to refer and by improving the current disproportion of workload to the present working staff. There is dyer & urgent need to formulate & implement solid & sustainable health policies particularly addressing the improvement in obstetrical & neonatal services to avoid the various preventable causes of neonatal morbidity and mortality.

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