ORIGINAL ARTICLE

Causes/Patterns of Admissions and Deaths at a tertiary care hospital in suburban area of Lahore

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ABSTRACT

Background: The pattern and outcome of neonatal diseases varies in urban and suburban areas of same population. Understanding these patterns also helps determine the availability, utilization and effectiveness of mother and child health services in the community.
Aim: To determine and correlate the pattern and outcome of neonatal admissions and death in a tertiary care hospital in suburban area of Lahore.
Methods: A prospective descriptive study was conducted in Avicenna Hospital neonatal unit targeting all neonates admitted during 1st Jun 2014 to 31st May 2015.
Results: Total 1268 patients were admitted during the study period. Birth asphyxia (26.66%) was found to be the major cause of neonatal admissions followed by sepsis(19.01%), prematurity(17.82%), Meconium aspiration (17.27%), neonatal jaundice (4.10%), infant of diabetic mother (2.84%) were other causes of admissions. Birth asphyxia (28.2%), sepsis (23.1%), prematurity (12.8%), Meconium aspiration (17.9%) and preterm hyaline membrane (15.4%) were the major causes of mortality seen.
Conclusion: Prematurity, birth asphyxia, neonatal infections and Meconium aspiration were the main causes of neonatal hospital admission and neonatal deaths in our study.
Keywords: neonateBirth asphyxia, prematurity, Meconium aspiration.

INTRODUCTION

Every year more than nine millions of children die in whole word and about 98% of these are of developing countries. 40-70% of infant mortality is contributed by neonatal mortality[1]. Nearly 50% of perianal death occurs in ante partum an intrapartum period and remaining 50% infirst week of life. Almost half of these deaths are due to severe infection, tetanus and asphyxia in countries with higher neonatal mortality rates (NMR) (NMR >45), whereas in developed countries where NMR is low (NMR<15)[1].

In 1990 global infant mortality was about 63 per 1000 live births it is reduced to 34 deaths per 1000 live births in 2013.Where as infant deaths have reduced from 8.9 million in 1990 to 4.6 million in 2013.

Annually there are estimated 4.5 Million neonatal deaths, whichare34% of the world's under-five deaths in the year 2000. It is observed thatcauses of neonatal deaths vary across countries andgeographical locations. Long term disabilities and impairments are mostly observed in countries with low resources and in these countries Babies born very preterm (i.e., gestational age <32 weeks) and with very low birth weight (VLBW) (<1,500g) have mortality rates of over 50%[2-4]. The aim of the Millennium Development Goals (MDG-4) is to reduce the child mortality (under 5 years) rate by two-thirds by the year 2015 from a baseline in 1990. According to The World Health Organization significant proportion (34%) of all under 5 deaths occur in the neonatal or perinatal (0 to 28 days of life) periods[5].so with this recognition of WHO demand for information on neonatal deaths is growing globally.

Estimated 130 million babies are born each year whereas annual neonatal death is estimated 4.5 Million globally and 50% die within the first 24 hours of life[6]. Globally highest neonatal mortality is in South Asian region with Pakistan having the highest neonatal mortality rate of 49/1000 followed by India 43/1000, Bhutan 38/1000, Bangladesh 36/1000, and Sri Lanka 11/1000[7].

Neonatal deaths contribute almost 50% of infant deaths in Pakistan[8].Commenest causes seen are infections, birth asphyxia and pre-maturity. Whereas the risk factors in mothers are poor antenatal care, poor nutrition and unavailability of proper medical facilities at the time of delivery and in post partum period. There is also poor newborn care and lack ofaccess to emergency care[9-12]. These maternal risk factors contribute to impaired growth during intrauterine life and premature labour[13]. Pre-maturityitself leads to multiple complications in neonate[14]. If proper resources are made available in

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Pakistan most of these causes of neonatal mortality are preventable[15-17]. The objectives of this study were to describe the pattern and causes ofneonatal admission, outcome and factors associated with its outcome so risk factors can be identified in our community.

MATERIALS AND METHODS

Avicenna Hospital is situated in Lahore district and serves a population who are mainly (90%) rural, It is a 550 beds a tertiary care teaching hospital with established maternity and neonatal care units. There are total of 16 beds in neonatal unit equipped with incubators, warmers and ventilators. It acts as a referral centre for rural clinics in this area.Antenatal care and care during delivery are provided in thehospital.

A prospective descriptive study was conducted targeting all neonatesadmitted to Avicenna Hospital neonatal unit during one year period from 1st Jun 2014 to 31st May 2015. Data was collected through the written Performa which included the profile of baby, causes of admissions, final diagnosis, ongoing complications and final outcome.Following terminologies were used in defining data:

Preterm: Live born neonate delivered before 37 weeks from first day of last menstrual period (LMP).

Low birth weight: Babies weighing less than 2.5 Kg at birth. Primary diagnosis of different diseases like birth asphyxia, prematurity, sepsis, respiratory distress syndrome was mainly made in all cases on the basis of the history and clinical examination. Then relevantinvestigations were carried out to reach a diagnosis like for neonatal sepsisblood culture, CBC with platelet count, C-reactive protein, CSF and Urine examination and culture were done. For Respiratory Distress Syndrome (RDS)X-ray chest andABG's was done.In cyanotic babies Pao2 and echocardiography was performed.Prothrombin time and activated partial thromboplastin time was done where hemorrhagic disease of newborn was suspected. Similarly other investigations were performed depending on the cause.

RESULTS

A total of 1,268 neonates were admitted during the study period. Male babies (57.49%) were more than female(42.51%) babies.More Babies were born at Term (57.4%) than preterm (42.6%) gestation. Extremely low birth weight (below 1,000 g) neonates made up 0.78% of the admissions. Almost 7.57% of neonates weigh 1,000 g-1499 g.16.67% were born with a birth weight of 1,500-1,999g. Neonate weighing 2,000 to 2,400gm were 27.28% and 2,500 and abovewere found in 47.7%. These are shown in Table 1.

Commonest mode of delivery was Caesarean section (49.66%), whereas 39.12% of babies were delivered by SVD. 8.64% and 1.56% were delivered by forceps and vacuum respectively.Most of babies 37.5% were admitted within first 6 hours of life, 28.3% at 1-3 day of age and 19.4% in 4-7 day, 9.7% at 7-14 day and 5.1% babies were admitted at 15-28 day of life.

In 9.11% of babies stayed in hospital for less than 6 hours most of these were delivered by Caesarean section and were admitted for observation only. 21.07% stayed for 1-3days. 46.74% and 17.9% were stayed for 4-7 days and 8-14 days respectively. Few patients (5%) stayed for longer than 15 days most of those were preterm, with sepsis and with birth asphyxia. Only two patients (0.18%), both preterm, stayed for more than 30 days

The most common cause of admission was Birth Asphyxia (26.66%). After that sepsis (19.01%), prematurity (17.82%) and Meconium aspiration (17.27%) were the commonest causes of admissions in hospital. Other primary causes of admission were Neonatal Jaundice (4.1%), Infant of Diabetic mother (2.84%), Diarrhea (2.52%), Preterm Hyaline membrane disease (2.21%),Pneumonia (2.13%), Meningitis (1.81%), and Hemorrhagic disease of newborn (1.10%). Whereas few cases of Neural tube defects (0.95),Metabolic Disorders (0.47%),Surgical Problems (0.39%),Dysmorphic features (0.24) and Congenital heart disease (0.16%) were seen. These causes are described in Table2.

Outcome of these babies are shown in Table 3. Out of 1268 patients 39(3.08%) were died, primary causes of mortality were prematurity, severe birth asphyxia, Meconium aspiration and severe septicemia. 27(2.13%) patients were referred to other health care facilities. 8(0.68%) patients Left against medical advice. Discharges on request were 156(12.30%) patients and remaining 1038(81.86%) were discharged.

Total 39(3.08%) patients were expired as shown in Table 4. Out of that birth asphyxia 11 (28.2%) was the leading cause of death in most of babies followed by sepsis 8(23.1%), prematurity 5(12.8%), Preterm Hyaline membrane disease 6(15.4%) and Meconium aspiration 7(17.9%). One patient (2.6%) of meningitis expired.

Table 1: Demographic and other outcome information of all the neonates who were admitted during June 2014 to May 2015 (n=1,268)

	n	%age
Gestational age		
Term	728	57.4
Preterm	540	42.6
Gender	1268	
Female	542	42.51
Male	726	57.49
Weight at admission		
500-999g	10	0.78
1,000-1,499	96	7.57
1,500-1,999g	211	16.67
2,000-2,499g	346	27.28
2,500 and above	605	47.7
Mode Of Delivery		
Normal vaginal delivery	496	39.12
Breech	12	1.02
Vacuum	20	1.56
Forceps	109	8.64
Caesarean Section	631	49.66
Age at Admission		
<12 hours	473	37.5
12-24 hours(1-3days)	359	28.3
4-7 days	246	19.4
7-14 days	125	9.7
15-28 days	65	5.1
Stay in Hospital		
0 (less than 6 hours)	116	9.11
1-3 days	268	21.07
4-7 days	592	46.74
8-14 days	227	17.9
15-28 days	63	5
> 30 days	2	0.18

Table 2: Diagnosis of neonatal conditions for Admission (n=1,268)

Diseases	n	% Admissions
Birth Asphyxia	338	26.66
Sepsis	241	19.01
Prematurity	226	17.82
Meconium aspiration	219	17.27
Neonatal Jaundice	52	4.10
Preterm Hyaline membrane disease	28	2.21
Infant of Diabetic mother	36	2.84
Diarrhea	32	2.52
Meningitis	23	1.81
Pneumonia	27	2.13
Hemorrhagic disease of newborn	14	1.10
Neural tube defects	12	0.95
Metabolic Disorder	6	0.47
Surgical Problems	5	0.39
Dysmorphic features	3	0.24
Congenital heart disease	2	0.16
Others	4	0.32

Table 3: Outcome of the patients admitted in hospital

Outcome	n	% Admissions
Expired	39	3.08
Left against medical advise	8	0.63
Discharge on request	156	12.30
Referred	27	2.13
Discharged	1038	81.86

Table 4: Diagnosis of expired patients (n=39)

Outcome	n	% expired
Birth Asphyxia	11	28.2
Sepsis	9	23.1
Prematurity	5	12.8
Meconium aspiration	7	17.9
Pretrem Hyaline membrane disease	6	15.4
Meningitis	1	2.6

DISCUSSION

Our study helps to identify the neonatal health care problems in a suburban area.The findings we get are similar to and can be applied to many other settings and countries, especially in other suburban areas in Pakistan and south East Asia. Most of our admissions were from our hospital and few were referred from other rural centers and also self-referred (i.e., babies delivered at home and then brought to the hospital). The predominance of males for admissions (57.4%) in our study was similar to the other international studies[18-21].

Like many other developing countries Prematurityand low birth weight continue to be the major public health problems observed in our setting[22-25]. Prematurity and its sequaelae are the main cause for hospital admission (42.6%) and neonatal deaths (prematurity 12.8%+Preterm Hyaline membrane disease 15.4%).Similarly, low birthweight of the neonates (LBW, <2,500gm) is responsiblefor higher rates of hospitalization (52.3%) and deaths. The overall the low birthweight rate at this hospitalis recorded at 52.3% and similar rates of low birthweight rates are observed in other studies[26,27]. Most of deaths in preterm occurred among the VLBW babies (<1,500g). These findings aresimilar to other studies in Pakistan, Africa and other low resourcecountries[1-4,26,27]. Different studies done worldwide identified that lack of proper antenatal care and maternal malnutrition are riskfactors for low birthweight babies. This is probably true in thisstudy asour target population was from rural back ground with poor knowledge of antenatal care and nutritional status[9,27]. Even In developed countries; efforts to lower the rate of preterm labour are unsuccessful. Under these circumstances more emphasis should on provision of good health care facilities and training in hospitals and communities for these babies.

A higher proportion of neonatal admission (26.6%) and death (28.2%) was associated with birth asphyxia while it was 34.5% in Multan[28], 18.8% from Karachi[26] and 20% from Dhaka[29].These suggest unskilled and inadequate care of women during labour. This also points toward the lack of awareness of neonatal resuscitation.This results in the delay of resuscitation of babies who are delivered outside the hospital.These factors are responsible for higher

hospitalization and death rates due to birth asphyxia (up to 41%) from other developing countries[18,24,30].These findings from our study and other studies suggests there should be mandatory antenatal and intrapartum monitoringfor all high risk pregnancies, timely referral and resuscitation at the time of birth.

Neonatal infection was the third leading cause of hospitalization (19.01%), The death rate was (23.1%).In developing countriessepsis remains the major cause of neonatal morbidity and mortality. Unsterilized delivery practices by local birth attendants, in small clinics and home deliveries are major contributing factors for neonatal sepsis[23,31]. Thus, we need to ensure that sterile practices during delivery.

After that other major cause of admission were Meconium aspiration syndrome that is not consistent with results from other studies. This may be due to referral from home deliveries and improper antenatal care in this rural area[24,25,28]. Most of these patients were referred after a trial from local birth attendants and quacks.

In our study, 81.86% babies were discharged with satisfactory improvement after treatment similar to other study in Multan[28]. Thisis may be due to increased awareness and trust of community in health profession.

Neonatal mortality was 3.08% in our study where as it was 8.1 in a previous study in Multan[28], 25% in Lahore[24,26], and it was 14.8% from Peshawar[18]. This is lower than other studies this may be due to 2.13% patients were referred to other health care facilities. Prematurity and its complications were found to be the major cause of mortality followed by birth asphyxia and sepsis. The same causes werereported from other studies from Pakistan[11] andIndia[12]. All these are alarming figures especially in Pakistan where neonatal mortality is already very high so this requires attention ofhealthcare providers.

This increased mortality can be reduced by precautionary measures like good antenatal monitoring of high risk pregnancies, early recognition, timely referral and resuscitation at the time of birth[16,29-31] The limitations of our study are that our results cannot be generalized because we only included babies who were brought to our hospital so it misses all those who failed to get any medical attention due to various socio-economicconstraints of our society.

CONCLUSION

In our study Prematurity, birth asphyxia,neonatal infections and Meconium aspiration were the maincauses of neonatal hospital admission and neonatal deaths. We found that low birthweight, sex of the baby, and preterm delivery were significant predictors of neonatal death. Through improved quality of antenatal, intrapartum and postpartum care a significant number of these deaths are avoidable.

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