Original Article

Risk factors and causes of death in Neonates

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ABSTRACT

Objectives

To identify the common causes and risk factors of neonatal mortality in a tertiary care Hospital.

Patients and Methods

This descriptive study was carried out at department ppediatrics/nursery, Liaquat University Hospital Hyderabad from July 2006 to December 2007. A total of 1203 neonates were admitted in the nursery during the study period; out of them 284 expired. These deaths were evaluated for age, gender, gestational age, birth weight, risk factors and cause of death.

Results

Out of 284 neonates 218 (76.7%) were low birth weight and 66 (23.2%) full term normal. Most deaths occurred in males except in preterm SGA females. The main risk factors identified were maternal anemia in 184 (65%), maternal malnutrition in 176 (62%), poor antenatal care in 109 (38.38%), grand multi-parity in 68 (23.9%), PROM in 50 (17.6%) followed by maternal fever in 24 (8.4%), APH in 23 (8.09%) and maternal UTI in 19 (6.6%). The most common causes of death were sepsis in 129 (45.4%), birth asphyxia in

68 (23.9%), respiratory distress syndrome in 38 (13.3%) and congenital anomalies in 14 (4.9%) neonates.

Conclusion

The mortality rate was high in preterm and low birth weight neonates. Measures to prevent neonatal mortality must be exercised with emphasis on skilled attendance at birth and appropriate care of preterm and low birth weight neonates.

Key words

Risk factors, neonatal mortality, birth asphyxia.

INTRODUCTION

Neonatal deaths account for about half of infant death in our country.[1] The neonatal period is defined as less than 28 days of life. It is a highly vulnerable period of life when a neonate may develop certain serious problems which lead to death.[2] Neonatal mortality in United States declined largely due to improvement in obstetric and neonatal intensive care as well as advances in diagnosis and treatment.[3] Neonatal morbidity and mortality is still high in developing countries and is due primarily to negligence of female health, nutrition, deliveries by un-skilled personnel and poor antenatal care.[4] Globally the major causes of neonatal death are estimated to be pre maturity, low birth weight, birth asphyxia and severe neonatal infections.[5] In Pakistan, high neonatal mortality is a major problem with its high relation to certain risk factors. The purpose of this study was to ascertain some of the potential risk factors associated with neonatal deaths in our institution.

PATIENTS AND METHODS

This descriptive analytic study was conducted from July 2006 to December 2007 at neonatal unit of pediatric department in Liaquat University Hospital Hyderabad. During

the study period, 1203 neonates were admitted in the nursery. Out of these 1203, 849 were full term and 354 were preterm. Out of these 1203 neonates, 919 were discharged, referred or left against medical advice. These 919 neonates were excluded from the study. The remaining 284 neonates expired and constitute this study. After taking informed consent, a maternal history was obtained regarding ante-natal check up, maternal anemia, fever, urinary tract infection, prolonged rupture of membrane, hypertension, diabetes mellitus, age, parity and natal history. Every neonate was evaluated for age in days, gender, gestational age, birth weight. Hemoglobin and urine analysis were carried out in each case.

RESULTS

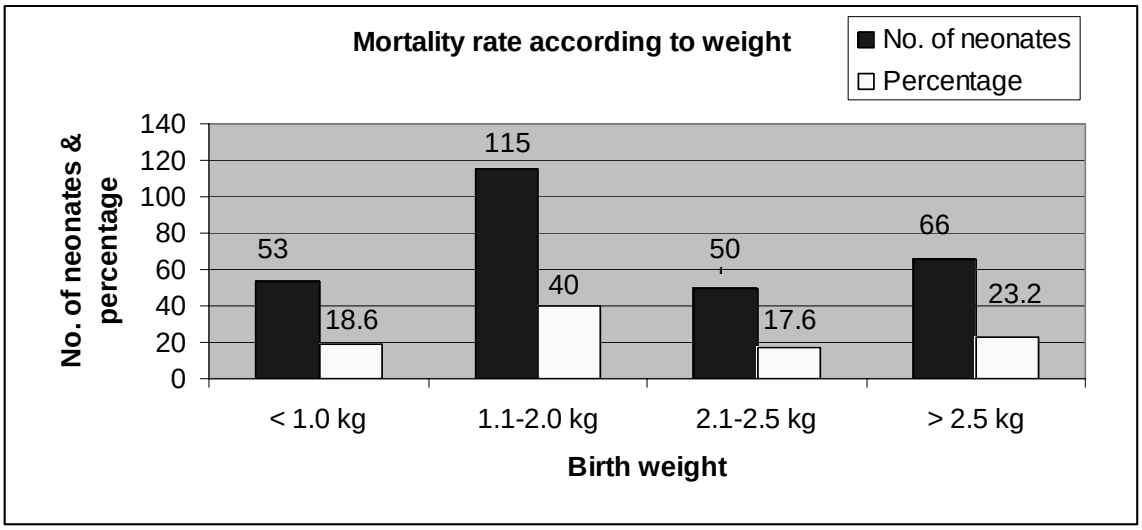
Out of 1203 neonates, 741 (61.59%) were male and 462 938.40%) female. Out of these 1203 neonates, 284 (23.6%) expired. Out of these 284 neonates, 95 (33.4%) were preterm AGA, 60 (21.1%) preterm SGA, 62 (21.8%) term SGA, 65 (22.8%) full term normal neonates, while one was post term SGA and another was full term LGA. In all these, males were predominant except term small for gestational age neonates (Table 1).

Table 1. Mortality rate according to gestational age. N=284

Birth weight	**Male**		**Female**		**Total**	
	n	%	n	%	n	%
Preterm AGA	59	(34.5)	36	(31.8)	95	(33.4)
Preterm SGA	32	(18.7)	28	(24.7)	60	(21.1)
Term SGA	27	(15.7)	35	(30.9)	62	(21.8)
Post term SGA	01	(0.5)	00	(0)	01	(0.3)
Full term normal birth weight	51	(29.8)	14	(12.3)	65	(22.8)
Full term LGA	01	(0.5)	0	(0)	01	(0.3)
Total	171		113		284	

Mortality rate according to birth weight is shown in figure 1.

Fig 1. Mortality rate according to birth weight.



Out of 284 neonates 174 (61.26%) were admitted within 24 hours of life, 23 (8.09%) within 72 hours and 87 (30.63%) were admitted after 72 hours of life. The mean duration of stay at nursery was 2 days. The main risk factor identified were maternal anemia, maternal malnutrition, poor antenatal care T(able 2).

Table 2. Risk factors responsible for mortality in Neonates. N=284

Risk factors	**Preterm AGA**	**Preterm SGA**	**Term SGA**	**Post-term SGA**	**Full term normal birth weight**	**Total**
	n %	n %	n %	n %	n %	n %
Maternal anemia	73 (39.67)	87 (47.28)	15 (8.15)	3 (1.63)	6 (3.26)	184 (65)
Maternal malnutrition	70(39.77)	84 (47.73)	11 (6.25)	12(6.82)	0 (0)	176 (62)
Poor antenatal care	42 (38.53)	15(13.76)	26 (23.85)	0 (0)	26(23.85)	109 (38.38)
APH	11(47.8)	6 (26)	6 (26)	0 (0)	0 (0)	23 (8.09)
Toxemia of pregnancy	07 (30.4)	06 (26.0)	9 (39.1)	0 (0)	01 (4.3)	23 (8.0)
Mal presentation	09 (36)	05 (20)	06 (24)	0 (0)	05 (20)	25 (8.8)
Twins	05 (35.7)	04 (28.5)	05 (35.7)	0 (0)	00 (0)	14 (4.9)
Maternal fever	04 (16.6)	03 (12.5)	13 (54.1)	0 (0)	04 (16.6)	24 (8.4)

Maternal UTI	05 (26.3)	02 (10.5)	09 (47.3)	0 (0)	03 (15.7)	19 (6.6)
Maternal Diabetes	0 (0)	01 (100)	0 (0)	0 (0)	00 (0)	01 (0.3)
PROM	13 (26.0)	19 (38.0)	09 (18.0)	01 (2.0)	08 (16.0)	50 (17.6)
Maternal age ‹20 years	05 (33.3)	08 (53.3)	01 (6.6)	0 (0)	01 (6.6)	15 (5.2)
Maternal age ›35 years	01 (8.3)	02 (16.6)	03 (25)	0 (0)	06 (50)	12 (4.2)
Grand multi-parity	21 (30.8)	18 (26.4)	15 (22.0)	0 (0)	14 (20.5)	68 (23.9)

Among 284 expired neonates, 130 (45.77%) died within first 24 hours of life and 154 (54.22%) died within 7 days. The result revealed that the cause of death in most cases was sepsis, birth asphyxia, respiratory distress syndrome and congenital anomalies (Table 3).

Table 3. Causes of death in Neonates. N=284

Cause of death	**Pre term AGA**	**Pre term SGA**	**Term SGA**	**Post term SGA**	**Full term normal**	**Total**
	n %	n %	n %	n %	n %	n %
Birth asphyxia	24 (35.2)	10 (14.7)	08 (11.7)	0 (0)	26 (38.2)	68 (23.9)
Sepsis	38 (29.4)	27 (20.9)	42 (32.5)	01 (0.7)	22 (17.0)	129 (45.4)
Respiratory distress syndrome	24 (63.1)	12 (31.5)	02 (5.2)	00 (0)	00	38 (13.3)
Severe pneumonia	00	00	00	00	02 (100)	02 (0.7)
Tetanus	01 (14.2)	00 (0)	02 (28.5)	00 (0)	04 (57.1)	7 (2.4)
Acute renal failure with sepsis	00 (0)	01 (33.3)	01 (33.3)	00 (0)	01 (33.3)	03 (1.0)
Congenital anomalies	03 (21.4)	01 (7.1)	07 (50.0)	00 (0)	03 (21.4)	14 (4.9)
Hypothermia with pre maturity	06 (46.1)	06 (46.1)	01 (7.6)	00 (0)	00 (0)	13 (4.5)
Meconium aspiration syndrome	00 (0)	00 (0)	02 (25.0)	00 (0)	06 (75.0)	08 (2.8)
kernicterus	02 (66.6)	01 (33.3)	00 (0)	00 (0)	00 (0)	03 (1.0)

DISCUSSION

This study shows that about 61.26% of neonates were admitted during first 24 hours of life and 30.63% were admitted after 72 hours of life reflecting that most of the neonatal problems occur during first 24 hours of life. A study from Lahore showed 70% of admission during first 48 hours.[6] Early neonatal mortality is a major problem in Pakistan.[7] In our study, 45.77% neonates died within 24 hours reflecting the seriousness of underlying condition while 54.22% neonates died within 7 days of life. Multiple studies have reported association of maternal anemia with neonatal mortality.[8] In our study, 65% mothers were anemic and mainly associated with preterm deliveries. Under nutrition in pregnant women is associated with low birth weight which was a major factor responsible for neonatal deaths reported from Karachi.[14] In our study, 62% mothers were undernourished.

In this study, grand multi parity showed a significant association with preterm and SGA (79.4%) as compared to full term and normal birth weight babies (20.5%). A significant association of maternal fever, UTI, and PROM with neonatal mortality was observed in preterm and low birth weight as compared to normal birth weight neonate. Similar results were reported from Islamabad.[11]

Ante partum hemorrhage and toxemia leading to spontaneous or intentional interruption of pregnancy add the compounding complication of pre maturity.[12] In this study, APH was seen only in preterm and SGA newborn and toxemia was also seen in majority of preterm and SGA babies as compared to normal weight babies. Young maternal age and mothers over 35 years of age are more likely to have preterm delivery and other complication of pregnancy.[13,14] In our study, young maternal age was associated with

preterm delivery but no difference was seen in mortality among preterm, SGA and normal weight babies where maternal age was over 35 years.

Low birth weight and pre maturity are the major clinical problem associated with neonatal mortality in both developed and developing countries,[15] because they are born before their body and organ system developed.[16] Despite considerable efforts the risk of mortality is still more in these neonates.[17] Results of our study indicate that mortality of preterm and low birth weight was 76.76%, among them the preterm were (54.57%) more then SGA (22.18%) and normal birth weight (23.23%) neonates. A report from Rawalpindi showed mortality rate of preterm and SGA as 69.4%.[18]

Neonatal sepsis is a significant contributor to perinatal mortality along with asphyxia and prematurity,[19,20] especially in Asia and Africa.[20] It was also the leading cause of death in this study. It was major cause of death in preterm (50.3%) and SGA babies. Perinatal asphyxia is a global problem[21] and has been reported as the commonest cause of death in a study from Lahore.[22] It was the second common cause of death in our study. Neonatal mortality in first week of life in Pakistan is 44 per thousand live births.[23] In this study, larger proportion of deaths occur during first 24 hours of admission mainly due to critical condition at admission, similar results were reported from other parts of the country.[24, 25] There was male predominance in our study which is also consistent with other studies.[25]

CONCLUSION

Infections are the leading cause of death followed by birth asphyxia and respiratory distress syndrome. Therefore, improving the obstetric care facilities and intensive care facilities for preterm low birth weight neonates will substantially reduces the mortality in Pakistan.

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