

A Study of Neonatal Outcome Associated with Preterm Birth in A Tertiary Care Hospital

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ABSTRACT:

INTRODUCTION:

Preterm birth is the most significant problem in current obstetric practice and according to WHO is the direct cause accounting for 24% of neonatal deaths.

OBJECTIVES:

To assess frequency and neonatal outcome in patients with preterm birth.

METHODOLOGY:

A prospective descriptive study was conducted at Gynae Unit III Jinnah Hospital Lahore over a period of one year (from 1st July 2011 to 30th June included in the study. For data collection two groups were made depending upon duration of pregnancy. Group I was allotted to women who were pregnant 2012) in collaboration with Paediatrics department. All labouring women who presented after 28 weeks and before 37 completed weeks of gestation were less (<) than 32 weeks and Group II was allotted to women who were

pregnant more (>) than 32 weeks of gestation. Data was collected and analyzed by SPSS version 16.

RESULTS:

During the study period total 5171 deliveries took place. Out of 5171 neonates born, 460 were preterm making the frequency of 8.86%. Majority 62.82% were > 32 weeks of gestation, 67.39% were male, 57.60% were > 1.5 kg by weight, 57.17% delivered vaginally and 80.86% were born alive. Neonatal morbidity was more common in neonates less than 32 weeks of gestation. Perinatal mortality was 10.48% in this study.

CONCLUSION:

Neonatal morbidity and mortality is more common in neonates less than 32 weeks of gestation, this can be improved by improving prenatal health services and advanced neonatal care.

KEY WORDS:

Preterm birth, Neonatal morbidity, Neonatal mortality.

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INTRODUCTION:

Preterm birth is a serious international public health issue. In short term, preterm infants require more medical treatment than full term infants, the treatment ranges from antibiotics and photo therapy to mechanical ventilation and total parenteral nutrition¹. Other complications of prematurity such as cerebral and retinopathy can lead to life long handicap².

Fifteen million babies are born preterm each year causing about 1 million deaths annually and life long problems for many survivors³. According to WHO preterm labor is defined as onset of labor

after the gestation of viability (20-28 weeks, depending on definition) and before 37 completed weeks or 259 days of pregnancy⁴. Age of viability is 20 weeks in developed and 28 weeks in developing countries. Preterm birth is further classified into three main categories; mild, very preterm and extremely preterm for births occurring at 32-36 weeks, 28-31 weeks and less than 28 weeks of gestation with average frequency of 85%, 10% and 5% respectively⁵. Over the past two decades despite major preventive efforts, the incidence of preterm birth has remained constant at about 5-10% of live births in developed and more in developing countries^{6,7}. Approximately 12.7% of births are preterm and 2% are less than 32 weeks. It is estimated that 70-80% of preterm births occur spontaneously, the remaining 20-30% of preterm births are due to intervention for maternal or fetal problems⁸. Worldwide data on the incidence of preterm births are unreliable but incidence ranges between 5% in developed and 25% in developing countries³. Wide scale national data is lacking in this respect to show the incidence in Pakistan⁹.

Though perinatal mortality in the UK has been fallen by two thirds over the last 30 years, the fall has been due to improved survival of preterm infants largely brought about by advance in neonatal care, but the incidence of preterm labour has not fallen significantly¹⁰. Aetiology of preterm birth is multi factorial being associated with preterm premature rupture of membranes, multiparity, malpresentation, multiple pregnancy, infections, anemia, hypertension, eclampsia, diabetes, lung and heart diseases¹¹. Associated predisposing factors include increasing age, illiteracy, poverty and people living in the rural areas¹². Neonatal complications which arise from preterm births are birth asphyxia, respiratory distress, low birth weight, infective neonatal hypoglycemia and ultimate death¹³.

Aim of the study was to see outcome of neonatal babies associated with preterm birth in a tertiary care hospital.

MATERIALS AND METHODS:

The study was conducted at Gynae Unit III Jinnah Hospital Lahore in collaboration with Paediatrics department from 1st July 2011 to 30th June 2012. Jinnah Hospital is a tertiary care hospital affiliated with Allama Iqbal Medical College. All

laboring women fulfilling the inclusion criteria who presented after 28 completed weeks and before 37 completed weeks of gestation were included in this study. Lower limit of age of viability was taken as 28 completed weeks of gestation according to Pakistan Penal Code. For data collection two groups were made according to duration of pregnancy. Group I was allotted to women who were pregnant less ($<$) than 32 weeks, and Group II who were pregnant more ($>$) than 32 weeks of gestation.

Data regarding gestational age, gender distribution, weight, mode of delivery, alive or still born, neonatal morbidities and cause of death was collected in collaboration with paediatric department and it was entered into SPSS version 16, a computer based statistical programme for statistical analysis of study data.

INCLUSION CRITERIA:

All the hospital based preterm deliveries after 28 weeks and before 37 completed weeks confirmed by dates or by an early ultrasound were included in this study.

EXCLUSION CRITERIA:

All women with unsure dates, high risk pregnancies like IUGR, severe PIH, diabetic and neonates with congenital abnormalities were excluded from the study.

RESULTS:

During the study period of the one year from 1st July 2011 to 30th June 2012. A total of 5171 deliveries occurred in our unit, 2230 babies were born by vaginal route and 2941 were by

LSCS (Lower segment caesarean section). Out of 5171 neonates born 460 were preterm making the frequency of 8.86%. Out of 460 preterm neonates 62.82% were $>$ 32 weeks of gestation and 37.17% were $<$ 32 weeks of gestation. Majority of them 67.39% were male, 57.60% had weight $>$ 1.5 kg and 42.39% were $<$ 1.5 kg. Vaginal delivery occurred in 57.17% and LSCS in 42.82%. Majority of preterm neonate 80.86% were born alive as shown in Table I.

Perinatal morbidity occurred more in neonates $<$ 32 weeks of gestation. Birth asphyxia was present in 27.41%, respiratory distress syndrome in 23.92%, feeding difficulties in 20.16%, meconium aspiration syndrome in 16.66%, neonatal hypoglycemia in 11.55%, jaundice in 10.75%,

sepsis in 8.06% and DIC in 5.37% as shown in Table II.

neonatal jaundice in 0.8% and DIC in 0.5% as shown in Table III.

In this study 39 preterm neonates died. The causes were birth asphyxia in 3.2%, respiratory distress syndrome in 2.6%, MAS in 1.9%, sepsis in 1.3%,

TABLE-I: Characteristic of Preterm Neonate (n = 460)

Neonatal Demographic Data	No. of cases	Percentage
Duration of gestation < 32 weeks > 32 weeks	171 289	37.70 62.82
Gender distribution Male Female	310 150	67.39 32.60
Weight < 1.5 kg >1.5 kg	195 265	42.39 57.60
Mode of delivery SVD LSCS	263 197	57.17 42.82
Alive Still birth	372 88	80.86 19.13

TABLE- II: Neonatal Morbidity (n= 372)

Morbidity	Total	%age	< 32 weeks		> 32 weeks		Relative Risk	95 % Confidence Interval
			No. of cases	%age	No. of cases	%age		
Birth asphyxia	102	27.41	75	20.16	27	7.25	1.31	0.29-5.99
Respiratory distress syndrome	89	23.92	68	18.27	21	5.64	1.71	0.01-10.50
Feeding difficulties	75	20.16	55	14.78	20	5.37	2.11	0.28-14.30
Meconium aspiration syndrome	62	16.66	45	12.09	17	4.56	2.08	0.27-15.30
Neonatal hypoglycemia	43	11.55	25	6.72	18	4.83	2.65	0.47-15.75
Neonatal jaundice	40	10.75	28	7.52	12	3.22	3.75	1.02-15.95
Sepsis	30	8.06	22	5.91	8	2.15	3.44	1.75-16.35
DIC	20	5.37	13	3.49	7	1.88	3.80	1.88-17.33

TABLE- III: Neonatal Mortality

Causes	No. of cases	%age	Relative Risk	95% Confidence Interval
Birth asphyxia	12	3.2	2.15	0.73-15.22
Respiratory distress syndrome	10	2.6	2.86	0.63-13.48
Meconium aspiration syndrome	7	1.9	2.62	0.92-14.31
Neonatal jaundice	3	0.8	1.16	0.87-3.27
Sepsis	5	1.3	2.03	0.13-2.81
DIC	2	0.5	3.12	0.81-3.43

DISCUSSION:

Preterm birth remains the leading cause of morbidity and mortality worldwide occurring in 7-11% of all deliveries³. In our unit the frequency of preterm birth was 8.86% during the study period and this is in consistent with other studies^{14,15,16}. Period of gestation remains the strongest determinant of postnatal outcome. Lesser the gestational age, worse would be the outcome.

In this study 62.82% neonates were > than 32 weeks and 37.17% were < than 32 weeks and this is similar with other studies^{14,17}. Regarding gender distribution it has been observed that women who have male sex in their womb go into preterm labor. In this study 67.39% neonates were male and 32.60% were female, this mimic with other studies^{17,18}. Weight of the newborn is a universal variable of neonatal outcome and various maternal risk factors are responsible for low birth weight. Perinatal morbidity and mortality is quite dependent on weight of the neonate at birth. In this study 57.60% neonates were > than 1.5 kg and 42.39% were < than 1.5 kg, this tallies with other study¹⁷. The optimal mode of delivery for preterm babies is controversial. Data from prospective randomized studies are very limited due to recruitment difficulties¹⁹. In practice however the rate of elective caesarean deliveries in preterm babies has markedly increased over the last decade but it has been observed in various studies that caesarean delivery did not enhance neonatal survival of preterm infants nor did it decrease the

morbidity in these infants. This is supported by other studies^{20,21}. In cohort 57.17% women delivered vaginally and 42.84% had caesarean delivery, this is similar with other study other study²⁰. In this study 80.86% neonate were alive and 19.3% were still born and this is supported by other studies^{18,20}.

Globally perinatal morbidity is quite common in developed and especially in underdeveloped countries. In our cohort perinatal morbidities observed were birth asphyxia, respiratory distress syndrome, feeding difficulties, neonatal hypoglycemia, neonatal jaundice, meconium aspiration syndrome, sepsis and disseminated intra vascular coagulation. Birth asphyxia was the commonest morbidity, 27.4% neonates had birth asphyxia, 20.16% were less than 32 weeks and 7.25% were more than 32 weeks of gestation. Respiratory distress syndrome was the second commonest morbidity observed in this study, 23.92% neonates suffered with this problem, 18.27% were < than 32 weeks and 5.64% were > than 32 weeks of gestation. The feeding difficulties were present in 20.16%, 14.78% were less than 32 weeks and 5.37% were more than 32 weeks of gestation. It has been observed in this study that birth asphyxia, RDS and feeding difficulties were present in those neonates which were low birth weight and this is supported by other studies^{17,22,23}.

MAS (Meconium Aspiration Syndrome) is a greivous morbidity seen in preterm neonates. In

this study 16.66% had MAS, 12.09% was present in neonates, < than 32 weeks of gestation and 4.56% was present in neonates > than 32 weeks of gestation this is similar with other studies^{22,23}. Neonatal hypoglycemia is a common morbidity encountered by < 32 and > than 32 weeks neonates as the result of an insufficient metabolic response to the abrupt loss of maternal glucose supply after birth. In our cohort, hypoglycemia was diagnosed in 11.55%, 6.72% was present in neonates < than 32 weeks of gestation and 4.83% in > 32 weeks of gestation. This is similar with other studies^{17,23,24}. Hypoglycemia may be symptomatic or asymptomatic. Prolonged hypoglycemia may result in neurological impairment and death.

Neonatal jaundice is a common morbidity seen in preterm infants. This is due to the immaturity of the hepatic enzymes. In this cohort, 10.75% neonates had hyperbilirubinemia, 7.52% and 3.22% was seen in infants < 32 weeks and > 32 weeks respectively. Phototherapy was required in these neonates. Previous studies also showed similar trends^{6,14}. Neonatal septicemia occurred in 8.06%. The neonates < 32 weeks suffer more septicemia than > 32 weeks. This tallies with other study^{14,17}. DIC occurred in 5.37% and mothers were eclamptic in these infants.

Perinatal mortality was 10.48% in this cohort and this is similar with other studies^{14,25}. The causes for neonatal mortality in this study were birth asphyxia in 3.2%, respiratory distress syndrome in 2.6%, meconium aspiration syndrome in 1.9%, neonatal jaundice in 0.8%, sepsis in 1.3% and DIC in 0.5 %, this mimic with other studies^{24,25}.

CONCLUSION:

From the results of this study it is concluded that prematurity is frequent finding in Pakistan. Though preterm birth remains a challenge to obstetricians but perinatal survival can be improved by improving perinatal survival can be improved by improving perinatal health services and advanced health care.

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