

PRETERM DELIVERY: A MAJOR PREDICTOR OF PERINATAL MORBIDITY AND MORTALITY

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ABSTRACT

Objective: To observe the risk factors for preterm labour and perinatal outcome in preterm fetuses.

Material and Methods: This descriptive observational study was carried out in department of Obstetrics and Gynaecology, Hayatabad Medical Complex, Peshawar from 1st December 2001 to 2002. Preterm deliveries confirmed by dates or early ultrasound between 28 and 36.6 weeks of gestation were included in this study. Socio demographic and clinical data was collected on a proforma. All data was analyzed using various statistical tests.

Results: During this study period, 100 cases were observed. Significant obstetrical risk factors for preterm labour were preterm rupture of membranes and malpresentation. 104 babies were born; where 10 babies were expired, thus perinatal mortality was 9.6%. The main causes of perinatal death were birth asphyxia (40%), respiratory distress (20%), and neonatal jaundice (20%). Breech presentation, period of gestation (≤ 32 weeks) and birth weight < 2 kg were the significant risk factors for perinatal mortality.

Perinatal morbidity occurred in 20 (19.2 %) babies. Significant morbidity was birth asphyxia (n=6), neonatal jaundice (n=6) and respiratory distress (n=4).

Conclusion: Significant risk factors for preterm labour were preterm premature rupture of membranes and malpresentation. Breech presentation, period of gestation and birth weight (< 2 kg) significantly contributed to early neonatal morbidity and mortality. These reflect ignorance and poor health services, which need to be improved by improving prenatal health services and advanced neonatal care.

Key Words: Preterm Delivery, Perinatal Morbidity, Mortality, Premature Rupture of Membranes, Malpresentation.

INTRODUCTION

Preterm delivery is defined as onset of labour after the age of viability (20 weeks) and before 37 completed weeks.¹ Preterm labour is the major cause of perinatal morbidity and mortality all over the world and huge burden on the cost of health care provision.^{2,3} Though perinatal mortality in the UK has fallen by two thirds over the last 30 years,⁴ this fall has been due to improved survival of preterm fetuses largely brought about by advances in neonatal care but the incidence of preterm labour has not fallen significantly.⁵ Incidence of preterm labour in most developed countries is 7-11%. Preterm delivery before 34 weeks accounts for three quarter (3/4) of neonatal mortality and one half of long term neurological impairment. Perinatal mortality is 80% at 24 weeks and $< 10\%$ after 30 weeks.⁶ Aetiology of preterm births is multifactorial being associated with infections, malpresentation, multiple pregnancy,

preterm premature rupture of membranes.^{7,8} Infection is the major cause accounting for about 40% of all causes of preterm birth.⁹ Complications, which arise from preterm birth, are birth asphyxia, respiratory distress, low birth weight, infection, neonatal hypoglycemia etc.

Keeping in mind the above facts, this study was conducted to assess risk factors for preterm labour and perinatal outcome in terms of perinatal mortality and morbidity.

MATERIAL AND METHODS

This descriptive observational study was conducted at Department of Obstetrics and Gynaecology, Hayatabad Medical Complex, Peshawar from 1st December 2001 to 2002.

All the hospital based preterm deliveries confirmed by dates or by an early ultrasound. Lower limit of period of viability was taken as 28

weeks.

Period of gestation was divided into two groups,

- i. 28-32 weeks
- ii. 33-36.6 weeks

All congenital abnormalities and unsure of dates were excluded.

All the clinical data regarding mother and baby was collected and analyzed by various statistical tests such as chi square, odd ratio and 95% confidence interval.

By using software, SPSS version 10 and Epi info 6, results were compiled after keeping various parameters in observation to draw conclusion regarding objectives of study.

RESULTS

Three hundred deliveries occurred during this study period in our unit. There were 250 preterm deliveries, thus frequency of preterm delivery was 12%. Only 100 cases fulfilled the inclusion criteria. Out of 100 cases, 79% of them presented with cephalic presentation and 21% were malpresentations.

Majority (65%) of patients delivered spontaneously, 3% by forceps delivery, while 24% underwent caesarean section (Table-1). Thirty two percent presented with moderate preterm labour, and 68% represented with mild preterm labour.

MODE OF DELIVERY

Mode of Delivery	Number of Deliveries n=100
Spontaneous vaginal delivery	65
Caesarean section	24
Forceps delivery	03
Assisted breech delivery	08

Table 1

Out of 104 babies delivered, 38.4% had birth weight between 1-2 kg, while 61.5% had birth weight between 2.1 to 2.5 kg. One minute Apgar score ranged between 2/10 to 6/10 in 15 babies (32.12%), while > 6/10 to 10/10 in 89 babies (67.8%).

Major risk factors for preterm labour were preterm premature rupture of membranes in 35% cases, malpresentation in 21% cases and spontaneous labour in 21% cases (Table 2).

Out of 104 babies, 10 babies were expired, thus perinatal mortality was 9.6%. The main causes of neonatal mortality were birth asphyxia in

ASSOCIATED RISK FACTORS

Mode of Delivery	No. of Cases n=100
Preterm premature rupture of membranes	35
Malpresentation	21
Spontaneous	21
Hypertensive disorders	14
Antepartum Haemorrhage	11
Previous caesarean section	06
Cervical incompetence	04
Diabetes	04
Multiple pregnancy	04

Table 2

4/10 cases, respiratory distress syndrome (RDS) in 2/10 cases and neonatal jaundice in 2/10 cases (Table 3).

The statistical analysis of risk factors for perinatal mortality showed breech presentation (p value 0.03), gestational age < 32 weeks (p value 0.03), and birth weight <2kg (p value 0.03) were the most significant associated risk factors (Table 4).

Perinatal morbidity occurred in 20 (19.2%) babies. The significant morbidities among preterm babies were birth asphyxia (n=6), neonatal jaundice (n=6) respiratory distress syndrome (n=4), neonatal sepsis (n=2), hypoglycemia (n=1) and disseminated intravascular coagulation (n=1). The important risk factors for perinatal morbidities are shown in Table 5.

DISCUSSION

Preterm labour remains the leading cause of perinatal morbidity and mortality world wide, occurring in 7-11% of all deliveries.⁶ In our unit, the frequency of preterm labour was 12% during study period, consistent with other studies.⁵

NEONATAL MORTALITY

Causes of Mortality	Number of Cases (n=10/104)
Birth asphyxia	4
RDS	2
Neonatal Jaundice	2
DIC	1
Neonatal Sepsis	1

Table 3

The important obstetrical risk factor for preterm labour was premature rupture of membranes (PROM) and malpresentations.¹⁰ PROM precedes labour in one third of preterm births. Early PROM seems to be a major obstetric and

RISK FACTORS ASSOCIATED WITH PERINATAL MORTALITY

Risk factors	No. of cases	Odd ratio	Relative Risk	P Value	95% Confidence interval
Preterm premature rupture of membranes	4	13.5	1.31	0.4498291	0.29-5.99
Malpresentation (Breech)	6	3.92	3.38	0.035150	1.02-11.15
APH	2	2.36	2.11	0.2850992	0.29-15.30
Hypertensive disorders	2	1.71	1.61	0.4020080	0.00-10.50
Multiple pregnancy	1	1.38	1.33	0.5678352	Confidence limit invalid
Period of gestation (28-32wk)	6	3.92	3.38	0.03515101	0.88-18.33
Birth weight <2kg	7	4.31	3.73	0.0310612	1.02-13.61
Mode of delivery					
i. Vaginal	8	2.27	2.12	0.2575305	0.47-9.45
ii. Caesarean	2	0.82	0.83	0.582835	0.11-4.6

Table 4

neonatal problem with pulmonary ramification extending over neonatal period.¹¹ Though PROM was a major risk factor for preterm birth, but no significant relationship was found between PROM and RDS in our study.

The second important risk factor was malpresentation (21%). Malpresentation are common risk factors in preterm labour.¹² Breech is the commonest of all and is an independent risk factor after simultaneous adjustment for other variables. Birth asphyxia was common among breech preterm births in our study.

Period of gestation remains the strongest determinant of postnatal outcome.¹³ Accurate estimation of gestational age is essential to differentiate between preterm and growth retarded fetuses. Therefore, unsure of dates were excluded from the study. Perinatal mortality was high (60%) in preterm births at 32 weeks comparable to other studies.¹⁴

Weight of new born is also a universal predictor of neonatal morbidity and mortality since

birth weight is a function of length of gestation.¹⁵ Low birth weight (< 2 kg) was significantly associated with birth asphyxia and perinatal mortality.

Perinatal morbidities observed were birth asphyxia, respiratory distress syndrome (RDS), neonatal hypoglycemia, neonatal jaundice, neonatal sepsis, and DIC. Birth asphyxia was the commonest morbidity. In some studies¹⁶, significant relationship was found between perinatal asphyxia, low birth weight, gestational age and breech delivery, but logistic regression revealed that birth weight was significantly associated with birth asphyxia. In this study, breech and gestational age less than 32 weeks was significantly associated with perinatal asphyxia. RDS was the second common morbidity, but no significant relationship was found with risk factors, e.g. PROM and malpresentation.

Neonatal hypoglycemia is a common morbidity encountered by both term and preterm babies.^{17,18} It may be either symptomatic or asymptomatic. Prolonged hypoglycemia may result

SIGNIFICANT PERINATAL MORBIDITIES

Perinatal Morbidity	Risk Factor	No. of Cases	Odd Ratio	Relative Risk	P-value	95% Confidence Interval
Birth asphyxia	Malpresentation	4	3.67	3.16	0.0591365	0.73-18.22
	POG < 32 weeks	6	4.79	4.12	0.0230032	1.10-15.48
Neonatal jaundice	Diabetes	2	10.11	5.56	0.0545798	0.87-3.27
Neonatal hypoglycemia	Diabetes	1	Invalid	—	0.0384615	Invalid
DIC	Pre-eclampsia	1	Undefi-ned	—	0.0108423	Invalid

Table 5

in neurological impairment and death. Neonatal hypoglycemia occurred in only one baby of diabetic mother, who was successfully treated and recovered.

Hyper bilirubinemia is also a commonest morbidity in neonatal period^{19,20}. Five percent of new born babies required intervention for pathological jaundice. Usually majority of preterm babies are jaundiced within the first week. Neonatal jaundice could be an emergency and leads to disaster. Neonatal jaundice occurred in 5.9% of babies and required admission in neonatal intensive care unit. The only significant risk factor for neonatal jaundice was maternal diabetes.

Neonatal septicemia occurs in 0.9% of babies, and was significantly associated with PROM.²¹ In our study, neonatal septicemia occurred in 4% of babies, but no significant relationship was found with PROM.

DIC occurred in one baby born to a preeclamptic woman, who was treated for RDS. It has been suggested that there is a systemic activation of clotting and fibrinolysis in preterm infants with advanced respiratory distress syndrome, while these changes are not evident in early stages of RDS.²² The significant risk factor for DIC was pre-eclampsia.

Perinatal mortality was 9.6% similar to Tariq P et al.²³ The causes for neonatal mortality were birth asphyxia, RDS, neonatal jaundice, neonatal sepsis, and DIC. Breech delivery, birth weight < 2 kg, and period of gestation \leq 32 weeks, were the three major contributors to perinatal mortality.

The lower limit of preterm birth varies in different countries. In Pakistan, lower limit of viability is taken as 28 weeks, which makes a difference of 8 weeks as compared to West. The perinatal mortality is still very high excluding congenital abnormalities.

CONCLUSION

The significant risk factors for preterm birth were malpresentation and PROM. Breech presentation, period of gestation (\leq 32 weeks) and birth weight (<2 kg) significantly contributed to morbidity and mortality, reflecting poor health services. Though preterm labour remains a challenge to obstetricians but perinatal survival can be improved by improving prenatal health services and advanced neonatal care.

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