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Original Research Article

A study of etiology and outcome of preterm birth at a tertiary care centre

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ABSTRACT

Background: Preterm births are still the leading cause of perinatal mortality and morbidity. It is a major challenge in the obstetrical health care.

Methods: This study was conducted over a period of eight months from September 2016 till April 2017 at a tertiary care hospital. All patients who delivered a live baby before 37 weeks of gestation were included in the study.

Results: Present study was conducted on 100 eligible women out of which 7 delivered before 30 weeks but majority of them (55%) delivered after 34 weeks of gestation. In our study, most of the patients (66%) presented in active phase of labor which resulted in preterm birth of baby. The most common risk factor of preterm labor was genitourinary tract infections (34%) followed by Preterm Premature rupture of membranes (22%). Past obstetric history of preterm delivery and abortions also had a significant impact on the present pregnancy outcome.

Conclusions: Preterm labour and birth still have a high incidence causing significant neonatal mortality and morbidity as well as economic burden on family and hospital. The causes of preterm birth are multifactorial and modifiable. This incidence can be reduced by early identification of established risk factors, as revisited and reemphasized in our study, with the help of universal and proper antenatal care.

Keywords: Delivery, Preterm birth, Risk factors

INTRODUCTION

Preterm birth is defined as any birth before 37 completed weeks of gestation since first day of the female's last menstrual period, according to WHO.¹ Preterm births still are the leading cause of perinatal mortality in developing countries. In addition to being a cause of mortality, preterm birth has long-term neurodevelopmental effects and higher risk of chronic diseases in adult life.

An estimated 14.9 million babies, 11.1% of all the live births worldwide were born preterm in 2010.¹ In industrialized countries, 5-11% of infants are born before

37 weeks of gestation, and the rate is increasing since the early 1980s. 10.6% neonates born in USA in 1990 were preterm, in the year 2000 the incidence increased to 11.6% and in 2004 to 12.5%.² In India the incidence of preterm labor is 23.3% and of preterm delivery is 10-69%.³ Nowadays progress has been made to improve the survival of premature neonates, mostly by timely interventions, antenatal administration of corticosteroids, better NICU care and exogenous surfactant therapy but still prematurity is the leading cause of neonatal morbidity and mortality. According to Copper et al preterm birth occurs in 7% to 11% of pregnancies but is responsible for 85% of neonatal deaths in normally

formed infants who do not have any congenital anomalies.⁴ Many conditions and demographic factors are associated with preterm births such as increasing maternal age, increased incidence of underlying health problems such as diabetes and hypertension, greater use of artificial reproductive techniques leading to higher rates of multiple pregnancies and liberal use of caesarean as well as planned inductions before term. The etiology still remains unknown in a large number of cases.⁵

METHODS

In the present study a total of one hundred pregnant women who delivered before 37 weeks of pregnancy at Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana from September, 2016 till April, 2017 were included after proper informed consent. All the antenatal patients who had preterm delivery, induced or spontaneous between 28 to 37 weeks of gestation were included in the study. The patients presenting with intrauterine fetal demise and congenital anomalies were excluded in our study. A detailed history of present pregnancy including genitourinary infections, antepartum haemorrhage, hypertension, PPRM, etc was taken. Past medical and surgical history along with past obstetrical history especially of preterm births and abortions was taken to determine the causative factor. Detailed examination general physical, systemic and obstetrical was performed. Gentle per speculum examination was done in all cases and a per vaginum examination was done if needed and Bishop scoring was noted. Risk factors related to preterm labor and neonatal outcome were recorded and analyzed. All investigations including complete haemogram, urine routine examination, urine culture and sensitivity, vaginal culture and sensitivity, ultrasonography and other basic investigations to evaluate the underlying cause of preterm labour was done. Gestational age at the time of delivery, mode of delivery and neonatal outcome in terms of birth weight and apgar score, morbidity and mortality was recorded. Stastical analysis was done using SPSS – 20 version software.

RESULTS

Present study was conducted on 100 eligible women out of which 7 delivered before 30 weeks but majority of them (55%) delivered after 34 weeks of gestation.

In present study, 66% patients presented in active phase of labor followed by fetal distress (11%) which resulted in preterm birth of baby.

Table 1: Gestation at the time of delivery.

| Gestational age in weeks | Number |
|--------------------------|--------|
| 28-30 weeks | 7 |
| 31-34 weeks | 38 |
| >34 weeks | 55 |

The relationship of preterm birth with maternal age was studied but only 3 cases were more than 35 years of age, so in our study maternal age was not observed as significant risk factor.

Table 2: Cause of preterm delivery.

| Cause | Number |
|-----------------------|--------|
| Active phase of labor | 66 |
| Antepartum hemorrhage | 10 |
| Acute fetal distress | 11 |
| Severe preeclampsia | 4 |
| Eclampsia | 7 |
| Chorioamnionitis | 2 |

In present study 61 women were multipara, 30 were primipara and only 9 were grandmultipara. The most common risk factor of preterm labor was genitourinary tract infections (34%) followed by Preterm Premature rupture of membranes (22%).

Table 3: Distribution of subjects according to risk factors.

| Risk factors | Number |
|-------------------------------------|--------|
| Age | |
| >35 years | 3 |
| Parity | |
| Primipara | 30 |
| Multipara | 61 |
| Grandmultipara | 9 |
| Past obstetric history | |
| Abortions | 16 |
| Previous preterm delivery | 8 |
| Present obstetric history | |
| Vaginal infection | 19 |
| UTI | 15 |
| PPROM | 22 |
| Polyhydramnios | 3 |
| Ante partum haemorrhage | 10 |
| Abruption | 7 |
| Placenta praevia | 3 |
| PIH | 21 |
| Multiple pregnancy | 4 |
| Twins | 3 |
| Triplets | 1 |
| Co morbid medical conditions | |
| Severe anaemia | 6 |
| Acute febrile illness | 4 |

Past obstetric history of preterm delivery and abortions also had a significant impact on the present pregnancy outcome. Past history of abortions was present in 16 patients and 8 patients had history of preterm delivery in previous pregnancies. In present study, antepartum haemorrhage and co-morbid medical conditions were seen in 10% cases in each group. In present study, 84 neonates required NICU admission. Neonatal mortality

was seen in 14 cases out of which 13 babies were born before 34 weeks of gestation.

Table 4: Neonatal morbidity and mortality.

| Neonatal Outcome | No. |
|-------------------------------|-----|
| NICU admission | 84 |
| Neonatal mortality | 14 |
| Respiratory distress syndrome | 16 |
| Asphyxia | 18 |
| Jaundice | 30 |
| Septicemia | 9 |
| Necrotising enterocolitis | 1 |
| Hypothermia | 12 |
| Hypoglycemia | 6 |

Most common ailment associated with preterm neonates was jaundice (n=30) followed by asphyxia which was seen in 18 cases, Respiratory distress syndrome in 16 cases and septicemia in 9 cases. In our study birth weight had significant association with neonatal mortality as all the babies weighing more than 2000 grams survived and both the babies weighing less than 1000 grams expired. Mortality rate was 66.66% in babies weighing 1000-1499 grams and 24% in babies weighing 1500-2000 grams.

Table 5: Association between birth weight and neonatal mortality.

| Weight (grams) | Number (total=104) | Mortality |
|----------------|--------------------|------------|
| <1000 | 2 | 2 (100%) |
| 1000-1499 | 9 | 6 (66.66%) |
| 1500-2000 | 25 | 6 (24%) |
| >2000 | 68 | 0 (0%) |

DISCUSSION

Preterm birth is a major challenge in health care and is associated with most of the perinatal deaths. In present study 896 live births took place during study period, out of which 100(11.16%) patients had preterm delivery. Singh U et al and Satija A et al reported an incidence of 20.9% and 20.4% respectively, but they included deliveries at <28 weeks of gestation.^{3,5} In present study most common reason for preterm delivery was patients presenting in active phase of labor (66%) which is comparable to incidence of 68.5% reported by Singh U et al.³ There are multiple factors associated with etiology of preterm labor. Singh U et al found that preterm rupture of membranes was frequently associated with preterm births (25.9%), we found preterm rupture of membranes to be associated with 22% preterm births.³

Chauhan N et al also reported PROM as a risk factor in 31.8% of cases.⁶ The previous obstetrical history was studied as one of risk factors for preterm birth, we found history of preterm delivery in 8 cases and history of abortion in 16% cases with preterm delivery. History of previous preterm delivery and abortion was observed to

be frequently associated with preterm births in various studies, Satija A et al and Singh U et al observed a positive history of previous preterm births in 12% and 14.4% cases of preterm labor as respectively.^{3,5} Moreau C et al concluded that previous history of induced increased abortions is associated with preterm births.⁷ In present study infections both vaginal and urinary were seen to be strongly associated with preterm delivery, 19% of cases had vaginal infection and 15% had urinary tract infections. Genitourinary infections has been reported to be one of the commonest risk factors in literature, Wright SP et al identified urinary tract infection (UTI) in 7% of preterm births.⁸ Goldenberg MD et al had also found a strong association between bacterial vaginosis and preterm labor.⁹ Singh U et al found genitourinary infection as the second commonest cause (20.7%), reporting UTI and vaginal infections in 8.4% and 12.25% cases respectively.³ Satija A et al found that 26% patients had vaginal infections and 20% had UTI.⁵ In present study antepartum haemorrhage was the causative factor in 10 cases of preterm births, out of these 7 patients had abruptio placenta for which termination of pregnancy was done. In a study conducted by Satija a et al antepartum haemorrhage contributed for 11% cases of preterm birth.⁵ In present study 84 neonates required neonatal intensive care unit (NICU) admission and the most common neonatal complications noted were jaundice (30%), followed by asphyxia (18%) and RDS (16%). Chauhan et al reported the incidence of jaundice (32.3%), RDS (22.6%) and asphyxia (13.7%) in their study.⁶ In present study, neonatal mortality was seen in 14 babies and mortality rate decreased with increasing gestational age, with only 1 mortality in group with more than 34 weeks of gestation, 6 deaths were seen in deliveries before 30 weeks and 7 between 31-34 weeks. Mortality rate of 18.18% was reported by Venkat S et al, Satija A et al reported 12.84% of mortality rate and Sonkusare S et al found the mortality rate to be 14.5% and mortality rate decreased with gestational age.^{5,10,11} In present study, birth weight had also shown a significant association with mortality as no death was reported in babies born with weight more than 2000 grams.

CONCLUSION

Preterm labour and birth still have a high incidence causing significant neonatal mortality and morbidity as well as economic burden on family and hospital. The causes of preterm birth are multifactorial and modifiable. This incidence can be reduced by early identification of established risk factors, as revisited and reemphasized in our study, with the help of universal and proper antenatal care. An active and integrated involvement of primary as well as tertiary health sectors can help in achieving this goal.

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