



ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

A PROSPECTIVE STUDY ON RISK FACTORS ASSOCIATED WITH PRETERM DELIVERY IN A TERTIARY CARE HOSPITAL

KEY WORDS:

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ABSTRACT

Background: Preterm birth (PTB) is a major determinant of neonatal mortality, morbidity and childhood disability. It has long-term adverse consequences for health. The causes of preterm delivery (PTD) are multifactorial. The major cause of infant mortality and morbidity is preterm birth. WHO has defined it as any birth before 37 completed weeks of gestation or fewer than 259 days since the last day of menstrual period. **Objective:** of present study was to find out preventive measure by timely identification and prognostification of Risk factors and to analyse fetal outcome in relation to these Risk factors. **Methods:** This prospective study was conducted on 100 pregnant women who were admitted with signs and symptoms of preterm labour at Rajkiya Mahila Chikitsalaya, JLN Medical College and Hospital during the period of 1 year from April 2019 to March 2020. Various parameters were analyzed like maternal characteristics, gestational age, associated risk factors, tocolysis and neonatal outcome. **Results:** Majority of patients (42%) were in age group 21-25 years. Although the risk factors included, maximum 36 subjects had Infection (UTI, Bacterial Vaginosis, etc) followed by HTN (28), Polyhydramnios (16), Oligohydramnios with growth restriction (3), Hypothyroidism (7), PPRM (12), Idiopathic (11), Anemia (8) and other less frequent risk factors. Among the 100 study subjects, 30 neonatal complications were noticed. Out of them, 15 had RDS and 4 has pneumonia. HHP, BPD, NEC, ROP, IVH and CP were the other neonatal complications reported. **Conclusions:** Various risk factors for preterm labour are modifiable hence early detection and treatment prevents maternal morbidity and neonatal morbidity and mortality. Specific emphasis on regular antenatal checkups. Early detection and treatment of diseases or disorders among pregnant women especially hypertension, genitourinary infections, oligohydramnios/ polyhydramnios as well as improving health care quality delivered to pregnant women may reduce the risk of preterm births according to our study.

INTRODUCTION

The World Health Organization defines preterm birth as any birth before 37 completed weeks of gestation or fewer than 259 days since the first day of woman's last menstrual period.

Incidence of preterm delivery is 1 in 10 births (11%) in USA and even greater births in developing countries. Around 40-75% neonatal deaths are attributable to preterm deliveries. Estimates of preterm birth rates range from 5-10% in developed countries to 25% in developing countries. In India, incidence of preterm labour is 23.3% and of preterm delivery is 10-69%. Preterm birth is a worldwide problem and to draw attention to it, since 2011, November 17 is celebrated as World's prematurity day.

Preterm births can be divided on the basis of gestational age into: Late preterm births: between 34-36 weeks, Early preterm birth: between 32-34 weeks, Very preterm birth: between 28-32 weeks, Extreme preterm birth: before 28 weeks.

The precludes leading to preterm birth include : Spontaneous labour with intact membranes (40-55%) , Preterm rupture of membranes (30%), Medically indicated or elective preterm birth (15- 20%).

American college of obstetrics and gynecology proposed the following criteria to diagnose preterm labour: Contraction of 4 in 20 minutes or 8 in 60 minutes plus progressive cervical change, Cervical dilatation greater than 1 cm, Cervical effacement of 80% or greater.

Prelabour rupture of membranes (PROM) is defined as the spontaneous rupture of amniotic membrane with a release of amniotic fluid at least one hour before the onset of labour. If the membranes before 37 weeks of gestation, it is termed as the preterm prelabour rupture of membrane (PPROM). Latent period is the time interval between the rupture of membranes and the onset of uterine contractions. Prolonged PROM is the

term used when more than 24 hours have elapsed before the labour ensues. Incidence of PPRM ranges from 3%-10% of all the deliveries. It leads to one third of preterm births.

OBJECTIVES

To assess the risk factors affecting preterm delivery in a tertiary care institute, To find out preventive measure by timely identification and prognostification of Risk factors and analyse fetal outcome in relation to these Risk factors.

METHODS

The study consists of 100 pregnant women who were admitted with signs and symptoms of preterm labour in the Department of Obstetrics and Gynaecology, JLN medical college, Ajmer during April 2019 to March 2020.

Inclusion criteria

Women with gestation age >24 weeks to <37 weeks who had spontaneous onset preterm labour and preterm premature rupture of membranes were included in the study. Medically indicated or elective preterm deliveries were also included in the study.

Exclusion criteria

Pregnancy beyond 37 weeks, Any congenital malformations such as anencephaly, hydrocephalus or multiple congenital anomalies, Multiple pregnancies.

The data was collected from mother case sheet and included age, parity, booking status, socio-economic status, gestation age, previous obstetric history, medical/obstetric complications in present pregnancy, cause of preterm delivery, if any, treatment profile.

Those subjects where induction of labour was done due to any medical or obstetrical indication, indication for induction and mode of delivery was recorded.

RESULT:

The present study was done on 100 pregnant women who were admitted with signs and symptoms of preterm labour in the Department of Obstetrics and Gynaecology, JLN medical college, Ajmer during April 2019 to March 2020.

TABLE - 1
Distribution according to Age Group

Age	No. of Cases
≤20	20
21-25	42
26-30	18
>30	20
Grand Total	100

Age distribution of all the study subjects has been depicted in Table 1 and Figure 1. Out of total 100 subjects, Majority of patients (42%) were in age group 21-25 years, 20% from >30, 20% from ≤20 and 18% were from 26-30 years age group.

TABLE 2:
Distribution of Cases according to Socio Economic Status

Socio Economic Status	No. of Cases
Upper Class	10
Upper Middle Class	12
Lower Middle Class	44
Upper Lower Class	20
Lower Class	14
Grand Total	100

Table 2 depict distribution of study subjects according to socio economic status as per Modified Kuppaswamy classification according to their education status, nutrition status, dietary habits, personal hygiene, awareness & access to medical care. Majority of patients were found in Lower middle class group (44%) followed by Upper lower class (20%) and Lower class (14%)

TABLE - 3
Distribution of Cases according to Obstetric History

Obs. History	No. of Cases
Primi	31
G ₂ P ₁₊₁	13
G ₃ P ₂	24
G ₄ P ₁₊₂	18
G ₅ P ₂₊₁₊₁₊₂	14
Grand Total	100

Table 3 depicts the distribution of study subjects as per their obstetric history. Maximum 69 subjects were multigravida (including previous preterm delivery & h/o abortion) and 31 were primigravida.

TABLE - 4
Distribution of cases according to Risk Factors

Risk Factors	No. of Cases
Infection (UTI, Bact vaginosis)	36
HTN	28
Poly Hydramnios	16
PPROM	12
Anemia	8
APH	8
Hypothyroidism	7
Placenta Prev	7
Multi Gestational	5
DM	5
Cervical Incompetence	4
Oligo with growth restriction	3
Malpresentation	3
Mat Card Dis	2
Fetal Anomaly	2
Idiopathic	11

Risk factors for preterm labor which were found to be present among the study subjects have been listed in table 8. Maximum 36 subjects had Infection (UTI, Bacterial Vaginosis, etc) followed by HTN (28), Polyhydramnios (16), Oligohydramnios with growth restriction (3), Hypothyroidism (7), PPRM (12), Idiopathic (11), Anemia (8) and other less frequent risk factors.

TABLE - 5
Distribution of cases according to Mode of Delivery

Mode of Delivery	No. of Cases
Spontaneous Vaginal	74
Assisted Vaginal	16
Elective LSCS	4
Emergency LSCS	6
Grand Total	100

Mostly cases (74/100) delivered spontaneously (vaginal delivery) while 16 were delivered through assisted vaginal delivery, 4 underwent elective LSCS and 6 had to undergo emergency LSCS.

In our study we have done 4 cases of elective LSCS due to placental insufficiency and IUGR and 6 cases of emergency LSCS due to antepartum haemorrhage, antepartum eclampsia, severe pre-eclampsia and abnormal presentation.

TABLE - 6
Distribution of cases according to Fetal outcome

Fetal outcome	No. of Cases
Discharge	94
Expire	6
Grand Total	100

Out of 100 cases, 94 were discharged and 6 newborns expired due to neonatal complications

DISCUSSION

Preterm birth (PTB) is the leading cause of infant morbidity and mortality in the world. In developing countries, the main causes of preterm births include infectious diseases and poor availability and accessibility of health care resources. Defining risk factors for prediction of preterm birth is a reasonable goal for several reasons. First, identification of at-risk women allows initiation of risk-specific treatment. Second, the risk factors might define a population useful for studying specific interventions. Finally, identification of risk factors might provide important insights into mechanisms leading to preterm birth. Yet, data regarding preterm births and risk factors are not routinely collected in hospitals. Therefore, to obtain insight into the risk factors for PTB, to find out preventive measure by timely identification and prognostification of risk factors and to analyse fetal outcome in relation to these Risk factors, this study was undertaken. For this study 100 pregnant women with signs and symptoms of preterm labour were selected.

It was found that maximum patients (42%) were from 21-25 years age group. Maximum patients (83%) were from rural area. Regarding socio-economic status, maximum patients (44%) were from lower middle class. Similar findings have been reported by Tellapragada et al. (2016). Among all 100 patients, 64% were unbooked. Maternal demographic characteristics have been found associated with preterm birth by many authors. India has a preterm birth rate of 13.6% and is amongst one of the top 5 countries for number of preterm births. The incidence of preterm birth in our study was 18.4%. Born et al (2012) speculated that this could probably be because of the fact that the pregnant women in other region are healthy. They avail antenatal services regularly and institutional deliveries are the norm.

Regarding BMI, it was found that of the total patients admitted for preterm labour, 81% were having normal BMI, 5% were

below normal BMI and 14% were having above normal BMI.

Of all patients, 12% patients were conceived with IVF and OI. In the obstetrical history, it was found that 31% were primiparous and 69% were multiparous. Olugbenga et al. (2010), Wagura et al. (2018) demonstrated that mothers with a parity of ≥ 4 were 4 times more likely to deliver prematurely. High parity is likely to increase the risk of preterm delivery due to uterine changes such as myometrial stretching from previous pregnancies. Some of the mothers with high parity may also have had a bad obstetric history which may be due to unidentified factors that may persist in subsequent pregnancies. Kiely et al. (1998) reported that the widespread availability of assisted reproduction has resulted in a large increase in the incidence of multiple gestations and this increase, in turn, has led to an increase in the preterm birth rate. The mechanism for preterm labour in multiple gestations and particularly higher order multiple gestations may be related to uterine distension, increased intrauterine volume, or related complications such as cervical incompetence. In particular, higher circulating levels of relaxin associated with super ovulation may cause cervical insufficiency, with subsequent PTB. Reduction of multifetal gestations, particularly high order multi fetal gestations, may improve neonatal outcome.

Regarding identification of risk factors, it was found that Infection, HTN, Poly-hydramnios, PPRM and hypothyroidism, were the most common risk factors which were prevalent in 36%, 28%, 16%, 12% and 7% patients. Among these few patients had multiple risk factors also. Due to morphological and functional changes that occur in pregnancy, stasis of urine favors UTI. Like other infections, UTI stimulate production of cytokines which may induce preterm labor through release of prostaglandins. Similarly Rao et al. (2014) reported that preterm delivery was significantly associated with hypertensive disorders of gestation (21.40%), height < 1.50 m, PPRM (17.50%), oligo-/polyhydramnios, threatened abortion, and twin gestation. Goldenberg et al. (2005) reported that Extremes in the volume of amniotic fluid—oligo- or polyhydramnios—are associated with preterm labour. Shrestha et al. (2010) reported that common risk factor associated with preterm birth were inadequate antenatal checkup (52%), maternal age (34.7%), ante partum hemorrhage (23.4%) and pregnancy induced hypertension (13.1%). Begum et al. (2003) identified low maternal BMI, poor socio-economic status, poor education as risk factors for preterm labour. While PTB is well acknowledged as a multifactorial process, ascending genital tract infections have previously been implicated in at least half of the cases. In particular, the causal relationship between Bacterial Vaginosis and PTB among women from various ethnic groups has been consistently noted. A few studies have reported the magnitude of BV during pregnancy among Indian women (6.4%, 24.3%, and 12%.

Among all studied patients, 70% had spontaneous labour while 30% had induced labour. 90% delivery were vaginal (spontaneous and assisted) and 10% were LSCS. Rao et al. (2014) reported comparatively lower percentage of spontaneous labour (40%).

When counting the gestational age, it was found that 84% had gestational age of < 34 weeks. Regarding baby birth wt., it was found that 3% were < 1.0 Kg, 10% were 1.0 – 1.5 kg, 37% were 1.51-2.0 kg and 51% were > 2.0 kg. Comparatively lower percentage (60%) was reported by Rao et al. (2014). The recent Indian National Family Health Survey (NFHS-3) reported 34% of LBW babies at national level, with higher prevalence in rural areas compared to urban regions. Authors of other case-control study stated that the high prevalence of LBW (26.8%) could be because both study hospitals were tertiary care centres located in the main city of their respective districts, where high-risk pregnancy cases are

referred to from surrounding villages and block.

APGAR score was calculated at 1 min and 5 min. At 1 min. 57% had APGAR score of < 7 and at 5 min 19% had APGAR score of < 7. 36% of the total newborns, had to admit in NICU. Among the total 30 cases which had neonatal complications, RDS was the most prevalent complication which was present in 15 cases.

Of the total 100 newborns, 6 could not survive while 94% were discharged as healthy. Talsania and Lala (1994) reported that neonatal morbidity also increased with the increased level of risk.

CONCLUSION

Preterm births require early and prolonged hospitalization posing great financial and psychological burden on the family and the society at large. Mostly, etiological factors of this condition are modifiable and can be well taken care of by preconceptional counseling. Preconceptional counseling emphasis should be on the risk factors of preterm births like family planning, good nutrition, safe sex, hygiene, treatment of sexually transmitted infections, avoidance of tobacco, alcohol, abusive drugs and harmful work conditions and hence reduce the burden of preterm births. All efforts should be made to continue the pregnancy till term for a healthy mother and a healthy baby.

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