



MATERNAL RISK FACTORS FOR PRETERM BIRTHS – A PROSPECTIVE STUDY

Gynaecology

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ABSTRACT

Background: The incidence of preterm birth in developing countries ranges from 12% to 18%. In India, out of 27 million babies born every year, 3.5 million babies born are preterm. Preterm birth complications are the leading cause of death among children under 5 years of age, responsible for approximately 1 million deaths. Neonatal mortality and morbidity associated with preterm births is significantly higher than term births. Preterm births require early and prolonged hospitalization posing great financial and psychological burden on the family and the society at large. Etiological factors of this condition are modifiable and can be well taken care of by preconceptional counselling.

Objectives: Developing a comprehensive list of evidence-based risk factors for preterm births

To study the relationship between socio-demographic factors, obstetric, fetal factors, chronic maternal diseases in preterm births.

METHODS: This prospective study was conducted at a tertiary care centre from November 2018 to October 2020. A total of 180 pregnant women with preterm labor were included in the study. After collecting detailed history, clinical examinations were carried out, and routine investigations were done and the results were recorded.

RESULTS: In our study we found preterm deliveries to be common among multigravida belonging to age group of 21-25 years, residing in rural areas with low educational status belonging to lower socioeconomic group. Majority of the women in our study were from gestational age group of 35-36 weeks and had a previous history of preterm birth. Women with urinary tract infections had higher incidence of preterm birth. It was also found that preterm labor was common in women who had less than 2 years of inter-pregnancy interval and had previous history of D&C.

CONCLUSION: The identification of women at high risk of preterm birth might improve with greater understanding of the etiology of preterm birth and with the availability of better indicators to predict the risk of preterm labor. This provides greater precision in targeting the subset of pregnant women who could benefit from supportive and specific interventions.

KEYWORDS

Preterm birth; Preterm labor; Interpregnancy interval.

INTRODUCTION

Preterm labor is one of the most challenging problems for both obstetricians and perinatologists, as it accounts to 50-75% of the perinatal mortality.¹

Preterm labor is defined by the World Health Organization as the onset of labor prior to the completion of 37 weeks of gestation, in a pregnancy beyond 20 weeks of gestation.² The lower limit of gestation is accepted to be 20 weeks in developed countries, but it is 28 weeks in developing countries. Preterm labor is considered to be established, if regular uterine contraction can be documented at least four in 20 minutes or eight in 60 minutes with progressive change in the cervical score in the form of effacement of 80% or more and cervical dilatation greater than 1cm.³

Worldwide, preterm birth is found to be the most common cause of neonatal morbidity and mortality. It accounts for 75% of neonatal deaths and 50% of long-term morbidity including respiratory disease and neurodevelopmental impairment.⁴

The incidence of preterm birth in developing countries ranges from 12% to 18%. In India, out of 27 million babies born every year (2010 data), 3.5 million babies born are preterm. India accounts for 23.6% of the global preterm births, out of which 13% are live preterm births. Following are the factors associated with increased risk of preterm labor:

Preterm premature rupture of membranes (PPROM), previous history of preterm labor/delivery, abruption, maternal smoking, advanced maternal age, stress, cervical insufficiency, uterine over distension from multiple gestation or polyhydramnios, uterine anomalies, urogenital infection (UTI, Bacterial vaginosis), intrauterine infection, uteroplacental insufficiency, environmental, genetic and fetal anomalies.⁵

Labor is not preventable in established preterm labor cases. The neonatal morbidity and mortality are due to respiratory distress syndrome, birth asphyxia, septicemia and intracranial haemorrhage.

The maternal morbidity associated with preterm labor is due to intrapartum and postpartum sepsis because of chorioamnionitis.

It is therefore important to identify 'at-risk' and symptomatic women early to allow prevention and management steps, to reduce the incidence of perinatal morbidity and mortality. The present study was undertaken to study the etiology and outcome of preterm labor which is an important obstetric problem.

AIMS AND OBJECTIVES

- 1) Developing a comprehensive list of evidence-based risk factors for preterm births
- 2) To study the relationship between socio-demographic factors, obstetric, fetal factors, chronic maternal diseases in preterm births.

MATERIALS AND METHODS

Source of data:

200 cases of preterm labor admitted in Chigateri General Hospital (CGH), Women and Children Hospital (WCH) and Bapuji Hospital (BH) attached to J.J.M. Medical College, Davangere were studied from November 2018 to October 2020 for a duration of 2 years. Patients who came in preterm labor with or without ruptured membranes were included in the study. They were evaluated by history taking, clinical examination and investigations.

Study design: A observational prospective study.

INCLUSION CRITERIA:

- 1) Women who are admitted at 28-37 weeks gestation having spontaneous preterm labor and/or spontaneous rupture of membrane and/or contractions with following findings,
 - a) At least 6 regular uterine contractions in 60 minutes
 - b) Cervix greater than or equal to 3cm dilated / 75% effaced
 - c) With or without leaking per vaginum.
- 3) Women who delivered preterm live births.

EXCLUSION CRITERIA:

- 1) Induced preterm delivery
- 2) Unable to determine the gestational age
- 3) Gestational age less than 28 weeks and more than 37 weeks.
- 4) Still births

RESULTS

Highest incidence was found in the age group of 21-25 years. Out of the 200 patients, 63.5% of the patients were from rural area and rest 36.5% were from urban background.

Out of 200 cases, 115 women were found to be illiterate and 85 were literate. Majority of pregnant women, about 110 patients were from Class-V. This shows 55% of patients who set into preterm labour were from class V and 22.5% were from class IV (low socio-economic status). 28.5% had history of tobacco consumption either in the form of tobacco chewing or smoking. Out of the 200 patients, 51% of the patients were multigravida and rest 49% were primigravida. Among multigravida, gravida-2 were 54.9%, gravida-3 were 28.42%; gravida-4 were 10.8%; gravida 5 and 6 were 4.9% and 0.98% respectively.

Table 1: Gestational Age

Gestational age (weeks)	Number of cases	Percentage
<30	9	4.5
30-32	15	7.5
33-34	73	36.5
35-36	103	51.5
Total	200	100.0

Out of 200 patients, the majority (51.5%) belonged to the gestational age of 35-36 weeks, 36.5% belonged to 33-34 weeks, 7.5% belonged to 30-32 weeks and only 4.5% belonged to less than 30 weeks of gestation.(Table 1)

In 200 cases, about 85.5% came with complains of pain abdomen, 46.5% had complains of leaking per vaginum and 25.5% patient complained of bleeding per vaginum.

Table 2: Maternal Obstetric Factors

Maternal Obstetric Factors	Number of cases (n=102)	Percentage
Previous history of preterm	43	42.2
Interval between two pregnancies		
≤2 years	75	73.5
3-4 years	22	21.6
>4 years	5	4.9
History of previous Dilatation and Curettage	21	20.6

The above table explains the maternal obstetric factors. Out of 102 multiparous women, 42.2% had previous history of preterm and 20.6% of them had undergone dilatation and curettage previously.

Among multiparous women, 75 (73.5%) women had less than 2 years of interval; 22(21.6%) had 3-4 years of gap and 5 (4.9%) women had more than 4 years of interval between the two pregnancies.(Table 2)

Out of 200 patients, 50.5% of the patients presented with intact membranes, 45% had ruptured membranes and 4.5% of the patients had clear high leak with membranes intact.

In our study, 42% of them had Urinary tract infection, 8% presented with febrile illness, 5.5% had lower respiratory tract infection and 1% had acute gastroenteritis.

In the present study, 170 patients delivered via vaginal route and 30 patients underwent caesarean section. 5 out of 200 patients had instrumental delivery(outlet forceps). Preterm assisted breech delivery were 12. Most common indications for caesarean section were fetal distress, prolonged PPROM and primi with breech. Others were: not willing for VBAC, previous LSCS with PPROM, non-reassuring FHR, cord prolapse and cord presentation.

Table 3: Neonatal Birth Weight

Birth weight (kgs)	Number of cases	Percentage
<1.5	20	10.0
1.5-2	48	24.0

2.1-2.5	127	63.5
>2.5	5	2.5
Total	200	100.0

Highest preterm babies were found in the weight group of 2.1-2.5 kgs of 127 cases (63.5%) compared to the weight group of 1.5-2 kgs of 48 cases (24%), <1.5 kgs of 20 cases(10%) and >2.5 kgs of 5 cases (2.5%).(Table 3)

Out of 200 babies, 78 babies (39%) have been admitted to NICU and 122 babies (61%) were found to be healthy and was given to mother side.

There were 20 babies whose birth weight were <1.5 kg, all of them had NICU admissions. In the range of 1.5 to 2 kg, out of 46 babies 41 had NICU admission. In conclusion we can say that, there is statistically significant association between lower birth weight and NICU admissions.

DISCUSSION

The birth of a preterm infant results in significant health consequences to the infant and emotional and economic costs for families and communities. Although advances in perinatal and neonatal care have improved the survival for preterm infants, those infants who do survive have a greater risk of developmental disabilities, health, and growth problems than infants born at full term. It is therefore important to identify 'at-risk' and symptomatic women early to allow prevention and management steps, to reduce the incidence of perinatal morbidity and mortality.

In the present study, 200 singleton pregnant women between the gestational age of 28 weeks to 37 weeks with preterm labor were enrolled. A detailed history was taken from all patients after informed and written consent. And various risk factors associated with preterm labor were assessed.

In our study, majority (43%) of women belonged to age group of 21-25 years, the mean age being 22.73 years which was similar to study conducted by Antonio Da Silva AM, Simoes MF⁶. Teenage pregnant mothers were 36.5%. Lowest age being 17 years and highest 40 years.

Out of the 200 patients, 51% of the patients were multigravida and rest 49% were primigravidae, which was similar to a study by Simonsen SE et al.⁷

Majority (51.5%) of pregnant women belonged to the gestational age of 35-36 weeks, 36.5% belonged to 33-34 weeks, 7.5% belonged to 30-32 weeks and only 4.5% belonged to less than 30 weeks of gestation similar to study by Lumley J.⁸

Maternal education is considered the most powerful determinant of health. In our study preterm labor was found to be more common among illiterate women who accounted for 57.5%. This finding was similar to the study conducted by Cantarutti A, et al⁹

In the present study, majority (63.5%) of the pregnant women were from rural area. We also found that infants of mothers with low education levels in rural areas are more vulnerable to neonatal complications because of limited access to high quality NICU care in rural areas.

The socioeconomic status bears a strong association with the preterm labor. We found that 55% of the pregnant women were from class-V and 22.5% of them were from class -IV of socioeconomic status thus showing high incidence among women with low socioeconomic status. In our study, 28.5% had history of tobacco consumption either in the form of tobacco chewing or smoking. Among multiparous women, 73.5% of them had less than 2 years of interpregnancy interval and 42.2% had previous history of preterm deliveries. 20.6% of multiparous women had undergone dilatation and curettage previously for first trimester miscarriage or termination of pregnancy. This shows that D&C for miscarriage or termination of pregnancy to be associated with an increased risk of subsequent preterm birth in favour of study conducted by M. Lemmers M, et al¹⁰

42% of pregnant women had Urinary tract infection as a major cause of preterm labour. Asymptomatic bacteriuria is associated with an increased rate of prematurity. Among the type of presentation, vertex was 91.5% and remaining 8.5% were non vertex presentation.

CONCLUSION

Preterm birth is the leading cause of new-born deaths and the second leading cause of death in children under five years of age.

The specific cause of preterm labor often isn't clear and it is usually multifactorial. Thus assessing all the risk factors in every women helps to identify population at risk and thereby helps in preventing preterm deliveries and neonatal complications.

Our study provides a multidisciplinary approach to understand the complex of interrelated biological, psychological, and social factors involved in preterm birth and thus help in prevention of pre-term births.

Some of the risk factors identified in this study may be modifiable through interventions targeted at women in the inter-conceptional period and help to prevent neonatal complications due to prematurity.

CONFLICT OF INTEREST: None

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ETHICAL CLEARANCE : Taken from Institution Ethics Committee

REFERENCES

1. Dasgupta S. Preterm labour. In: Immunological basis of pathophysiology. Mukherjee OG, Buckshee K eds., 1st edition, 1998 .pp.4-7.
2. Hilder L, Costeloe K, Thilaganathan B. Prolonged pregnancy: evaluating gestation-specific risks of fetal and infant mortality. Br J Obstet Gynaecol 1998 Feb; 105(2):169-73
3. Clausson B, Cnattingius S, Axelsson O. Outcomes of post-term births: the role of fetal growth restriction and malformations. Obstet Gynecol 1999 Nov; 94(5Pt 1): 758-62.
4. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. Lancet. 2008;371(9606):75-84.
5. Ashadeep Chandra reddy : Etiopathogenesis of Preterm Labor. World Clinics: Obstetrics and Gynecology: Preterm Labor 2013.
6. Da Silva AA, Simoes VM, Barbien MA, Bettiol H, Lamy-Filho F, et al. Young maternal age and preterm birth. Paediatric and Perinatal Epidemiology 2003 Oct;17:332-339.
7. Simonsen SE, Lyon JL, Stanford JB, Porucznik CA, Esplin MS, et al. Risk factors for recurrent preterm birth in multiparous Utah women: a historical cohort study. BJOG 2013;120:863-872.
8. Lumley J. The epidemiology of preterm birth. Bailliere's Clinical obstetrics and Gynaecology 1993 Sept;7(3):477-498.
9. Cantarutti A, Franchi M, Compagnoni MM, Merlino L, Corrao G. Mother's education and the risk of several neonatal outcomes: an evidence from an Italian population – based study. BMC Pregnancy and Childbirth 2017;17:221-230.
10. Lemmers M, Verschoor MAC, Hooker AB, Opmeer BC, Limpens J, Huirne AF, Ankum WM, et al. Dilatation and curettage increases the risk of subsequent preterm birth: a systematic review and meta-analysis. Human Reproduction 2016;31(1):34-45