Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Obstetrics & Gynecology

Clinical Status of Patients with Preterm Labour

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DOI: https://doi.org/10.36347/sjams.2026.v14i06.003 | **Received:** 12.03.2026 | **Accepted:** 28.04.2026 | **Published:** 02.06.2026

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Abstract **Original Research Article**

Background: Preterm labor is a major contributor to neonatal morbidity and mortality, particularly in developing countries. It is influenced by multiple socio-demographic and obstetric risk factors. ***Objective:*** To evaluate the clinical profile and associated risk factors of patients presenting with preterm labor. ***Methods:*** This cross-sectional analytical study was conducted at the Department of Obstetrics and Gynaecology, Sir Salimullah Medical College and Mitford Hospital, Dhaka, from June 2019 to November 2019. A total of 100 pregnant women aged 18–40 years with gestational age between 28–37 weeks were included, comprising 50 cases with preterm labor and 50 controls with normal pregnancy. Socio-demographic variables, obstetric characteristics, and clinical history were analyzed using Chi-square test and odds ratio. ***Results:*** Baseline characteristics such as age, gravidity, and employment status were comparable between groups. Significant associations were observed between preterm labor and socio-economic status (p=0.041), number of prenatal care visits (p=0.018), and previous history of preterm labor (p=0.006). Women with inadequate antenatal care had a higher risk of preterm labor. Additionally, a history of previous preterm labor increased the relative risk by 2.081 times. ***Conclusion:*** Preterm labor is strongly associated with socio-economic disadvantage, inadequate antenatal care, and adverse obstetric history. Early identification and modification of these risk factors may help reduce the incidence of preterm labor and improve maternal and neonatal outcomes.

Keywords: Preterm labor, Risk factors, Socioeconomic status, Antenatal care, Obstetric history.

INTRODUCTION

Preterm labor and subsequent preterm birth represent a significant challenge in obstetric practice, particularly in developing countries like Bangladesh, where they are a leading cause of neonatal morbidity and mortality and account for a substantial proportion of infant deaths globally. [1] Preterm labor is defined as the onset of labor before 37 completed weeks of gestation and affects approximately 10–15% of all pregnancies. [2,3]

The etiology of preterm labor is complex and multifactorial. A large proportion of cases are spontaneous and idiopathic, while others are associated with preterm rupture of membranes or medically indicated early delivery. [4] Several maternal and obstetric factors contribute to its occurrence, including infections such as urinary tract infections, asymptomatic bacteriuria, and bacterial vaginosis, as well as ascending intrauterine infection and inflammation. [5,6]

In addition, socio-demographic and clinical risk factors such as multiple pregnancy, polyhydramnios, hypertensive disorders, maternal illnesses, cervical incompetence, antepartum hemorrhage, fetal anomalies, maternal anemia, heavy physical work, and smoking are associated with increased risk.[7] Socio-economic status, nutritional condition, and geographic location also influence the incidence of preterm labor. [8] Previous obstetric history, particularly prior preterm birth, remains an important predictor.

Understanding the clinical and obstetric profile of patients presenting with preterm labor is essential for early identification, timely intervention, and improved maternal and neonatal outcomes. Sir Salimullah Medical College and Mitford Hospital, being a major tertiary

referral center, manages a large number of such cases. Therefore, this study was designed to evaluate the clinical characteristics and associated factors of patients with preterm labor in this setting.

General Objective

To evaluate the clinical profile and associated risk factors of patients presenting with preterm labor.

Specific Objectives

- To evaluate the socio-demographic characteristics of patients with preterm labour.
- To assess obstetric characteristics of patients presenting with preterm labour.
- To determine the association of clinical factors (e.g., prenatal care, previous obstetric history) with preterm labour.

METHOD

This cross-sectional analytical study was conducted in the Department of Obstetrics & Gynaecology at Sir Salimullah Medical College & Mitford Hospital, Dhaka, over a six-month period from June 2019 to November 2019. The study population comprised pregnant women who were either admitted to the labor ward or attended the antenatal clinic during the study period and met the inclusion criteria. A purposive convenient sampling technique was used. Although the calculated sample size using the formula $n = z^2pq/d^2$ (with z = 1.96, p = 0.05, q = 0.95, d = 0.05) was approximately 73, a total of 100 participants were included due to time constraints, with 50 cases and 50 controls. The participants were divided into two groups: Group I (cases) included 50 women presenting with signs of preterm labor between 28 and 37 weeks of gestation, and Group II (controls) included 50 pregnant women of similar gestational age (28–37 weeks) who were not in labor. Inclusion criteria included pregnant women aged 18–40 years with singleton gestation and intact membranes, while exclusion criteria comprised multiple pregnancies, antepartum hemorrhage, fetal congenital anomalies, intrauterine death, premature rupture of membranes, cervical incompetence, uterine leiomyoma, and uterine malformations. A detailed history was obtained focusing on demographic and obstetric variables, along with clinical symptoms such as muscle cramps and vaginal discharge. Thorough physical and obstetric examinations, including per speculum and per vaginal assessments, were performed. Laboratory investigations included complete blood count, random blood sugar, routine urine examination, and estimation of serum magnesium levels. Data were collected through face-to-face interviews, clinical examination, and laboratory findings using a structured questionnaire after obtaining informed written consent. The collected data were analyzed using SPSS version 21.0, where continuous variables were expressed as mean ± SD and categorical variables as frequency and percentage. Statistical analyses were performed using unpaired Student's t-test, Chi-square test, and correlation coefficient test, with a p-value of <0.05 considered statistically significant and <0.001 as highly significant.

RESULT

Table 1: Age distribution of study patients

Study group			
Age (years)			**p- value***
	Group I (n=50)	**Group II (n=50)**	
18 – 22	24 (48.0)	22 (44.0)	
23 – 28	19 (38.0)	18 (36.0)	
29 – 34	4 (8.0)	5 (10.0)	
			0.183
35 – 40	3 (6.0)	5 (10.0)	
Range (Min-Max)	18-40	18-40	
Mean ± SD	24.13 ± 4.69	25.25 ± 5.74	

Values in brackets indicate percentage.
* = Unpaired Student's t-test

Table 1 shows the age distribution of the study patients. The mean age in group I was 24.13±4.69 years while in group II it was 25.25±5.74 years. No statistically significant difference was observed in patients' age between the two groups (p>0.05).

Table 2: Distribution of study patients by social characteristics

Study group			
Variables			**p- value†**
	Group I (n=50)	**Group II (n=50)**	
Employment status			
Housewife	41 (82.0)	42 (84.0)	0.68
Employed	9 (18.0)	8 (16.0)	

Socio-economic class			
Upper	3 (6.0)	8 (16.0)	
			0.041*
Middle	15 (30.0)	20 (40.0)	
Lower	32 (64.0)	22 (44.0)	

Values in brackets indicate percentage.
† = Chi-square test (χ^2), * = significant p-value

Table 2 shows social characteristics of study patients. The employment status was similar in both groups with 41 (82.0%) in group I and 42 (84.0%) in group II of homemakers. Majority (64.0%) patients in Group I belonged to lower socioeconomic class, whereas in Group II only 44.0% patients belonged to this class. There was no significant difference in employment status (p=0.68) while for socioeconomic classes, there was statistically significant difference between two groups (p=0.041).

Table 3: Distribution of obstetric characteristics in both study groups

Study group			
Variables			**p- value**
	Group I (n=50)	**Group II (n=50)**	
Gravidity			
1	33 (66.0)	28 (56.0)	0.41†
≥ 2	17 (34.0)	22 (44.0)	
No. of prenatal care visits			
No visit	6 (12.0)	2 (4.0)	0.018†
< 4	17 (34.0)	11 (22.0)	
≥ 4	27 (54.0)	37 (74.0)	
Gestational age (weeks)	34.64 ± 1.46	35.27 ± 1.41	0.39*

Values in brackets indicate percentage.
† = Chi-square test (χ^2), * = Unpaired Student's t-test

Table 4 shows distribution of obstetric characteristics of both study groups. Prenatal care was taken irregularly (less than 4 times) in less than half of participants (34.0%) of group I and three-fourth participants (74.0%) in group II received prenatal care regularly (at least 4 times or more). There was a significant difference in number of prenatal visits between the two groups (p<0.05, OR=5.34, 95% CI=1.36-3.36). No significant differences were found between group I and group II with respect to gravidity (p=0.41) and gestational age (p=0.39).

Table 4: Distribution of study patients by previous obstetric history

Study group			
Variables			**p- value†**
	Group I (n=50)	**Group II (n=50)**	
History of abortion			
Yes	7 (14.0)	5 (10.0)	0.207
No	43 (86.0)	45 (90.0)	
History of previous preterm labor*			
			0.006
Yes	10 (20.0)	4 (8.0)	
No	40 (80.0)	46 (92.0)	

Values in brackets indicate percentage.
† p value reached from Chi-square test (χ^2)
* RR = 2.081 (95% CI = 1.172-2.349)

Table 4 shows distribution of study patients by previous obstetric history. Though the percentage of history of abortion was higher in group I patients (14.0%) than group II (10.0%), but the apparent difference was not statistically significant. Group I patients had higher percentage of previous history of preterm labor (20.0%) compared to group II (8.0%) and the difference was statistically significant (p<0.05). The relative risk (RR) of preterm labor in present pregnancy is 2.081 times higher among the patients with history of previous preterm labor.

DISCUSSION

Preterm labor is a multifactorial condition influenced by a wide range of socio-demographic, obstetric, and clinical factors. In this study, baseline characteristics such as maternal age, employment status, gravidity, and history of abortion were comparable between the preterm labor group and controls, suggesting that these variables did not significantly influence the observed outcomes. Similar findings were reported by Kamal *et al.,* Okunade *et al.,* and Mahmoud *et al.,* [9-11] However, Cunningham *et al.,* reported a significant association between maternal age, employment status, and preterm labor, which differs from the present findings. [12] This discrepancy may be due to differences in study population and setting.

The study demonstrated a significant association between inadequate prenatal care and preterm labor (OR=5.34), consistent with previous findings. [13] Reduced antenatal visits may lead to delayed identification of risk factors and increased likelihood of adverse pregnancy outcomes, including low birth weight and preterm delivery.

Socio-economic status was also significantly associated with preterm labor, with a higher proportion of cases observed among women from lower socio-economic backgrounds ($p<0.05$). This finding is consistent with previous studies. [14,15] Poor socio-economic conditions may contribute through inadequate nutrition, increased physical workload, stress, and limited access to healthcare services. However, some studies have reported non-significant associations, possibly due to smaller sample sizes.[16]

No statistically significant difference in gestational age distribution was observed between the study groups ($p=0.39$), indicating appropriate comparability. Previous obstetric history, particularly prior preterm labor, was associated with an increased risk (RR=2.081), which aligns with established evidence identifying it as a strong predictor of recurrence.[17]

This study was conducted in a single tertiary care government hospital, where most patients belong to similar socio-economic backgrounds. This may limit the generalizability of the findings and could explain some variations compared to other studies.

In summary, the present study highlights that preterm labor is strongly associated with socio-economic disadvantage, inadequate prenatal care, and adverse obstetric history. Identification and modification of these risk factors through improved antenatal care and health education may help reduce the incidence of preterm labor and improve maternal and neonatal outcomes.

CONCLUSION

Preterm labor is significantly influenced by socio-economic factors, inadequate prenatal care, and previous obstetric history. Strengthening antenatal care services, improving maternal education, and ensuring early risk identification are essential to reduce the burden of preterm labor. Targeted interventions in high-risk populations may contribute to better maternal and neonatal outcomes.

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