

RESEARCH ARTICLE

# Prospective Evaluation of Pregnancy Outcomes in Women Presenting with First-Trimester Vaginal Bleeding

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## Abstract

**Background:** First-trimester vaginal bleeding is a common obstetric complication, affecting approximately one-fifth of all clinically recognized pregnancies. While many such pregnancies continue normally, early bleeding has been associated with an increased risk of adverse maternal and fetal outcomes. However, the magnitude and pattern of these outcomes vary across populations, and prospective data from tertiary care settings remain limited.

**Objectives:** To prospectively evaluate maternal and fetal outcomes in pregnancies complicated by first-trimester vaginal bleeding and to assess the spectrum of adverse outcomes associated with this condition.

**Methods:** This prospective observational study was conducted in the Department of Obstetrics and Gynecology, Sylhet MAG Osmani Medical College Hospital and Mount Adora Hospital, Akhalia, Sylhet, Bangladesh from March 2021 to February 2022. Seventy (70) pregnant women presenting with vaginal bleeding during the first trimester ( $\leq 12$  weeks of gestation) were enrolled. Women with ectopic pregnancy, molar pregnancy, known bleeding disorders, or pre-existing medical illnesses were excluded. Detailed clinical history, examination findings, and ultrasonographic parameters were recorded at presentation. Participants were followed throughout pregnancy to document maternal outcomes, including abortion, preterm labor, placenta previa, and placental abruption, as well as fetal outcomes such as birth weight, gestational age at delivery, intrauterine growth restriction, stillbirth, and neonatal intensive care unit admission.

**Results:** Of the 70 women studied, spontaneous abortion occurred in 30.0% of cases. Among pregnancies that progressed beyond the first trimester, 42.9% resulted in term delivery, while 17.1% ended in preterm birth. Maternal complications included preterm labor (24.5%), placenta previa (12.2%), and placental abruption (8.2%). Adverse fetal outcomes were common, with low birth weight observed in 30.6% of neonates, intrauterine growth restriction in 20.4%, and neonatal intensive care unit admission in 26.5% of cases.

**Conclusion:** First-trimester vaginal bleeding is associated with a significantly increased risk of pregnancy loss and adverse maternal and fetal outcomes. Pregnancies complicated by early bleeding should be considered high risk and require closer antenatal surveillance to improve perinatal outcomes.

**Keywords:** First-Trimester Vaginal Bleeding, Threatened Abortion, Pregnancy Outcome, Maternal Outcome, Fetal Outcome, Prospective Study.

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## 1. Introduction

First-trimester vaginal bleeding is one of the most frequent complications of early pregnancy, occurring in approximately 20–25% of clinically recognized pregnancies [1]. The clinical significance of early pregnancy bleeding varies widely, ranging from benign implantation bleeding to severe conditions such as ectopic pregnancy and inevitable abortion. Despite advances in ultrasonography and biochemical markers, predicting pregnancy outcome following first-trimester bleeding remains challenging. Threatened abortion, defined as vaginal bleeding before 20 weeks of gestation with a closed cervical os and a viable fetus, represents the most common presentation [2]. Although many such pregnancies progress normally, multiple studies have demonstrated an association between early pregnancy bleeding and adverse outcomes, including miscarriage, preterm birth, low birth weight, placental abruption, and placenta previa [3,4]. The underlying mechanisms are not fully understood but may involve defective placentation, inflammatory processes, and hormonal insufficiency. In low- and middle-income countries, the burden of adverse pregnancy outcomes related to early bleeding is particularly significant due to delayed presentation and limited access to early ultrasound evaluation [5]. Identification of prognostic factors such as gestational age at bleeding, severity and recurrence of bleeding, and ultrasonographic findings (e.g., subchorionic hematoma) is crucial for counseling and management [6]. Previous studies have shown conflicting results regarding long-term fetal outcomes in pregnancies complicated by first-trimester bleeding. While some authors report no significant difference in perinatal outcomes among pregnancies that progress beyond the first trimester [7], others report increased rates of preterm delivery, fetal growth restriction, and neonatal intensive care unit admission [8]. These inconsistencies may be due to variations in study design, population characteristics, and definitions of bleeding severity. Given these uncertainties, prospective studies with careful follow-up are essential to better understand the true impact of first-trimester vaginal bleeding. This study was designed to prospectively evaluate maternal and fetal outcomes in pregnancies complicated by first-trimester bleeding in a tertiary care setting and to identify factors associated with adverse outcomes.

## 2. Methods

### 2.1 Study Design and Setting

This prospective observational study was conducted

in the Department of Obstetrics and Gynecology, Sylhet MAG Osmani Medical College Hospital and Mount Adora Hospital, Akhalia, Sylhet, Bangladesh from March 2021 to February 2022.

### 2.2 Study Population

A total of 70 pregnant women presenting with vaginal bleeding during the first trimester ( $\leq 12$  weeks of gestation) were enrolled. Gestational age was calculated based on last menstrual period and confirmed by ultrasonography.

### 2.3 Inclusion Criteria

- Pregnant women with vaginal bleeding in the first trimester
- Singleton pregnancy
- Willingness to provide informed consent and comply with follow-up

### 2.4 Exclusion Criteria

- Ectopic pregnancy
- Molar pregnancy
- Known bleeding disorders
- Chronic medical illnesses such as diabetes mellitus or hypertension diagnosed prior to pregnancy

### 2.5 Data Collection

Detailed history including age, parity, obstetric history, gestational age at bleeding, amount and duration of bleeding was recorded. Clinical examination and transvaginal or transabdominal ultrasonography were performed to assess fetal viability, gestational sac, and presence of subchorionic hematoma.

Participants were followed throughout pregnancy with routine antenatal care. Maternal outcomes (abortion, preterm labor, placenta previa, placental abruption) and fetal outcomes (birth weight, gestational age at delivery, intrauterine growth restriction, stillbirth) were documented.

### 2.6 Statistical Analysis

Data were entered and analyzed using standard statistical software. Categorical variables were expressed as frequencies and percentages. Associations between first-trimester bleeding characteristics and outcomes were analyzed using chi-square test, with  $p < 0.05$  considered statistically significant.

### 3. Results

**Table 1.** Socio-Demographic Characteristics of the Study Population (N = 70)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	<25	28	40.0
	25–30	30	42.9
	>30	12	17.1
Parity	Primigravida	38	54.3
	Multigravida	32	45.7

Table 1 summarizes the socio-demographic profile of the study participants. The largest proportion of women belonged to the 25–30-year age group (42.9%), followed by those younger than 25 years (40.0%). Women aged over 30 years constituted a smaller fraction (17.1%). With respect to parity,

primigravidae formed the majority (54.3%), while multigravidae accounted for 45.7%. This distribution reflects a relatively young obstetric population with a slight predominance of first-time mothers, which is typical of women presenting with first-trimester complications in tertiary care settings.

**Table 2.** Pregnancy Outcomes

Outcome	Number (n)	Percentage (%)
Spontaneous abortion	21	30.0
Term delivery	30	42.9
Preterm delivery	12	17.1
Stillbirth	7	10.0

Table 2 depicts the overall pregnancy outcomes among women with first-trimester vaginal bleeding. Spontaneous abortion was observed in 30.0% of cases, indicating a substantial risk of early pregnancy loss in this group. Among pregnancies that continued, 42.9% resulted in term delivery, demonstrating that nearly half of affected pregnancies can still achieve

a favorable outcome. Preterm delivery occurred in 17.1% of women, while stillbirth was recorded in 10.0% of cases. These findings highlight the wide spectrum of outcomes associated with first-trimester bleeding, ranging from pregnancy loss to successful term delivery.

**Table 3.** Maternal Complications in Ongoing Pregnancies (n = 49)

Complication	Frequency (n)	Percentage (%)
Preterm labor	12	24.5
Placenta previa	6	12.2
Placental abruption	4	8.2
No complication	27	55.1

Table 3 outlines maternal complications observed in pregnancies that progressed beyond the first trimester. More than half of the women (55.1%) did not develop any major antenatal complications. However, preterm labor emerged as the most frequent complication, affecting nearly one-quarter (24.5%) of ongoing

pregnancies. Placenta previa was identified in 12.2% of cases, while placental abruption occurred in 8.2%. The increased incidence of placental disorders supports the association between early pregnancy bleeding and abnormal placentation.

**Table 4.** Fetal Outcomes

Fetal Outcome	Frequency (n)	Percentage (%)
Low birth weight	15	30.6
Intrauterine growth restriction	10	20.4
NICU admission	13	26.5

Table 4 presents the fetal outcomes among live births in the study population. Low birth weight was observed in 30.6% of neonates, indicating a significant burden

of compromised fetal growth. Intrauterine growth restriction was documented in 20.4% of cases, further emphasizing the impact of early pregnancy bleeding

on fetal development. Additionally, 26.5% of neonates required admission to the neonatal intensive care unit, reflecting increased neonatal morbidity. These findings demonstrate that first-trimester vaginal bleeding is not only associated with early pregnancy loss but also with adverse neonatal outcomes among surviving pregnancies.

#### 4. Discussion

The present prospective study demonstrates that first-trimester vaginal bleeding is significantly associated with adverse pregnancy outcomes. The rate of spontaneous abortion in this study (30%) is comparable to previously reported rates ranging from 20–40% [9,10]. Early gestational age at bleeding and recurrent episodes were associated with increased risk of pregnancy loss. Among pregnancies that progressed beyond the first trimester, the incidence of preterm delivery (17.1%) was higher than that reported in the general obstetric population, supporting findings from earlier studies [11]. Defective placentation has been proposed as a common pathophysiological mechanism linking early bleeding with later complications such as preterm labor and placenta previa [12]. Placenta previa was observed in 12.2% of ongoing pregnancies, which is higher than baseline prevalence. Similar associations have been reported by Weiss et al., who suggested that early bleeding may reflect abnormal implantation in the lower uterine segment [13]. Placental abruption, though less frequent, further supports the theory of placental dysfunction. Fetal outcomes in the present study also showed increased rates of low birth weight and intrauterine growth restriction. These findings are consistent with those of Johns et al., who reported impaired fetal growth in pregnancies complicated by first-trimester bleeding [14]. Chronic uteroplacental insufficiency following early placental injury may contribute to these outcomes. The strengths of this study include its prospective design and systematic follow-up. However, limitations include the relatively small sample size and single-center setting, which may limit generalizability. Despite these limitations, the findings underscore the importance of considering first-trimester bleeding as a marker of high-risk pregnancy. Early identification of women at risk allows for closer antenatal surveillance, patient counseling, and timely intervention, which may improve both maternal and fetal outcomes.

#### 5. Conclusion

First-trimester vaginal bleeding is associated with increased risk of spontaneous abortion, preterm delivery, and adverse fetal outcomes. Pregnancies complicated by early bleeding should be considered high risk and managed with careful antenatal monitoring to improve outcomes.

#### 6. References

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