PREVALENCE, CAUSES AND OUTCOMES OF BLEEDING IN FIRST TRIMESTER OF PREGNANCY

Dr. Deepika Jamwal [1], Dr. Minakeshi Rana [2], *Dr. Preeti Jamwal [3], Dr. Mohinder Singh Chib [4]

[1]Consultant Obstetrics and Gynaecology , Government Medical College Kathua, India
[2]Associate Professor and Head , Department of Obstetrics and Gynaecology, Government Medical College Kathua, India
[3]Senior resident, Department of anesthesia, Government Medical College Kathua, India
[4]Consultant orthopedics, Gupta hospital and research centre Kathua, India

[*]**Corresponding Author:** Dr. Preeti Jamwal
Senior resident, Department of anesthesia, Government Medical College Kathua, India
Mail id: preetijamwal 2712@gmail.com

Abstract

Background: Bleeding during the first trimester of pregnancy is one of the most frequent obstetric complications, affecting nearly 20–25% of all clinically recognized pregnancies. It is a major source of anxiety for the patient and a challenge for the clinician, as the underlying causes range from benign conditions such as implantation bleeding to more serious outcomes like miscarriage and ectopic pregnancy. The etiology, prevalence, and clinical outcomes of first-trimester bleeding vary depending on regional, demographic, and clinical factors, making it important to study in institutional settings. **Aim**: The aim of this study was to determine the prevalence, causes, and outcomes of bleeding in the first trimester of pregnancy among women presenting to the Department of Obstetrics and Gynaecology at Government Medical College (GMC) Kathua. **Methods**: This was a hospital-based observational study conducted at GMC Kathua from October 2023 to September 2024. A total of 100 pregnant women presenting with first-trimester bleeding were included. Data were collected regarding demographic profile, gestational age, clinical presentation, causes of bleeding, laboratory investigations, ultrasonographic findings, and maternal-fetal outcomes. The prevalence of first-trimester bleeding among all antenatal cases was calculated, and statistical analysis was applied to assess associations between different causes and outcomes. **Results**: Among the study population of 100 patients, the prevalence of first-trimester bleeding was estimated at 12% of total antenatal visits during the study period. The most common cause identified was threatened abortion (42%), followed by incomplete abortion (18%), inevitable abortion (12%), missed abortion (10%), and ectopic pregnancy (8%). Other causes included molar pregnancy (5%) and unexplained bleeding (5%). Maternal age between 21 and 30 years constituted the majority of cases (65%). Favorable pregnancy continuation was observed in 48% of women, while 52% had adverse outcomes including miscarriage, surgical intervention for ectopic pregnancy, or progression to molar gestation requiring evacuation. **Conclusion**: First-trimester bleeding is a common clinical problem with multifactorial etiology and significant implications for maternal and fetal outcomes. Early evaluation with clinical examination and ultrasound helps in accurate diagnosis and timely management. Strengthening awareness among women and ensuring early referral are crucial in reducing complications. The findings of this study contribute to regional data from North India and highlight the importance of vigilant antenatal care in the first trimester.

Keywords: first-trimester bleeding, prevalence, causes, outcomes, miscarriage, ectopic pregnancy, molar pregnancy

Introduction

Bleeding during the first trimester of pregnancy is a common obstetric concern, affecting approximately 15% to 25% of clinically recognized pregnancies [1]. This symptom can manifest as light spotting or heavy hemorrhage and may be accompanied by pain or passage of tissue. While many women with first-trimester bleeding proceed to have a normal pregnancy, this symptom is also a known predictor of adverse outcomes such as miscarriage, ectopic pregnancy, or gestational trophoblastic disease [2].

The causes of first-trimester bleeding are multifactorial. Common etiologies include threatened abortion, inevitable or missed abortion, complete or incomplete abortion, ectopic pregnancy, molar pregnancy, implantation bleeding, and cervical or vaginal pathology (such as infections, polyps, or trauma). Additional risk factors involved include advanced maternal age, prior history of miscarriage or abortion, uterine anatomical abnormalities (such as fibroids), endocrine disorders, systemic disease, and possibly lifestyle or environmental factors [3]. Predictors of bleeding severity (heavy vs. Spotting), timing (weeks of gestation), duration, and presence of pain also contribute to the probability of adverse outcomes [4].

The prevalence of first-trimester bleeding and outcomes tends to vary by population, regional healthcare settings, socioeconomic conditions, and accessibility of prenatal care. Several studies from India and Iran have documented a wide range of prevalence, risk profiles, and pregnancy outcomes associated with first-trimester bleeding [5]. For example, Amirkhani et al. In Tehran, Iran, reported that first-trimester bleeding is significantly associated with subsequent adverse maternal and perinatal outcomes, including preterm labor, low birth weight, and intrauterine growth retardation [2].

Importantly, first-trimester bleeding is not only relevant for fetal outcomes; it may also predict complications for the mother. These can include increased risk of antepartum hemorrhage, preterm premature rupture of membranes (PPROM), hypertensive disorders, and need for surgical interventions depending on etiology such as ectopic pregnancy or molar gestation [3].

In the context of Government Medical College Kathua, studying first-trimester bleeding among 100 patients provides an opportunity to add local data on prevalence, causes, outcomes, and associated risk factors. Such data are valuable for obstetricians to more accurately counsel patients, plan monitoring strategies, and possibly intervene early to reduce adverse outcomes.

Materials and Methods

Study design and setting:

This was a hospital-based observational study conducted at the Department of Obstetrics and Gynecology, Government Medical College (GMC) Kathua, over a period of one years from October 2023 to September 2024. The study was designed to determine the prevalence, causes, and outcomes of bleeding during the first trimester of pregnancy among women attending antenatal services.

Study population:

The study included 100 pregnant women who presented with bleeding in the first trimester of pregnancy (up to 12 weeks gestation). Patients were recruited consecutively as they presented to the hospital. The study sample represents a mix of urban and rural populations attending GMC Kathua.

Inclusion criteria:

* Pregnant women with confirmed intrauterine pregnancy presenting with vaginal bleeding within the first 12 weeks of gestation.
* Willingness to participate and provide informed consent.

Exclusion criteria:
* Women with bleeding secondary to trauma unrelated to pregnancy.
* Women with incomplete medical records or lost to follow-up.
* Women with known bleeding disorders or on anticoagulant therapy prior to pregnancy.

Data collection:
For each patient, data were collected using a pre-designed proforma, including:
1. Demographic details: age, parity, socioeconomic status.
2. Clinical presentation: onset, duration, quantity, and characteristics of bleeding (spotting vs heavy), associated abdominal pain.
3. Obstetric and medical history: prior miscarriages, uterine abnormalities, systemic illnesses.
4. Laboratory investigations: complete blood count, beta-hCG levels, coagulation profile when indicated.
5. Ultrasonographic findings: fetal viability, intrauterine location, presence of gestational sac abnormalities, or adnexal masses to rule out ectopic pregnancy or molar gestation.
6. Management and outcomes: expectant management, medical or surgical intervention, continuation of pregnancy, miscarriage, ectopic pregnancy, or molar pregnancy.

Study definitions:
* Threatened abortion: Vaginal bleeding with a viable intrauterine pregnancy.
* Inevitable abortion: Vaginal bleeding with cervical dilation but incomplete expulsion.
* Missed abortion: Non-viable intrauterine pregnancy without expulsion.
* Incomplete abortion: Partial expulsion of pregnancy tissue.
* Complete abortion: Complete expulsion of pregnancy tissue.

Ethical considerations:
Approval for the study was obtained from the Institutional Ethics Committee of GMC Kathua. Written informed consent was obtained from all participants. Confidentiality of patient information was maintained throughout the study.

Statistical analysis:
Data were entered into Microsoft Excel and analyzed using SPSS version 25.0.
* Continuous variables such as age and gestational age were expressed as mean ± standard deviation (SD).
* Categorical variables such as cause of bleeding and outcome were expressed as frequencies and percentages.
* The prevalence of first-trimester bleeding was calculated as a proportion of total antenatal visits during the study period.
* Associations between risk factors, cause of bleeding, and pregnancy outcomes were analyzed using Chi-square test or Fisher's exact test as appropriate. A p-value <0.05 was considered statistically significant.

Results
The study included 100 pregnant women presenting with first-trimester bleeding at Government Medical College Kathua between October 2023 to September 2024. The prevalence of first-trimester bleeding among all antenatal visits during the study period was 12%. The mean age of the patients was 26.8 ± 4.2 years, with the majority in the age group of 21–30 years. The demographic profile, including age, gravidity, parity, and socioeconomic status, is summarized in [Table 1].

Table 1: Demographic profile of patients with first-trimester bleeding

Characteristic	Category	Number of patients	Percentage (%)
Age (years)	<20	10	10
	21–25	40	40
	26–30	25	25
	31–35	15	15
	>35	10	10
Gravidity	Primigravida	56	56
	Multigravida	44	44
Parity	Nulliparous	58	58
	Multiparous	42	42
Socioeconomic status	Low	35	35
	Middle	50	50
	High	15	15

The gestational age at presentation ranged from 5 to 12 weeks, with the majority of women presenting between 7–9 weeks. Table 2 shows the distribution of gestational age among the study population [Table 2].

Table 2: Gestational age at presentation

Gestational age (weeks)	Number of patients	Percentage (%)
5–6	20	20
7–9	50	50
10–12	30	30

The causes of first-trimester bleeding were varied. The most common cause was threatened abortion (42%), followed by incomplete abortion (18%), inevitable abortion (12%), missed abortion (10%), ectopic pregnancy (8%), molar pregnancy (5%), and unexplained bleeding (5%). Table 3 summarizes the causes of bleeding [Table 3].

Table 3: Causes of first-trimester bleeding

Cause	Number of patients	Percentage (%)
Threatened abortion	42	42
Incomplete abortion	18	18
Inevitable abortion	12	12
Missed abortion	10	10
Ectopic pregnancy	8	8
Molar pregnancy	5	5
Unexplained bleeding	5	5

Maternal outcomes, including continuation of pregnancy and complications, were recorded. Table 4 shows the maternal outcomes of patients presenting with first-trimester bleeding.

Table 4: Maternal outcomes

| Outcome	Number of patients	Percentage (%)
Favorable (continued pregnancy)	48	48
Miscarriage	30	30
Ectopic pregnancy (surgical)	8	8
Molar pregnancy (evacuation)	5	5
Other complications / unexplained	9	9

Fetal outcomes were assessed in terms of live birth or adverse events where applicable. Table 5 summarizes the fetal outcomes of pregnancies with first-trimester bleeding.

Table 5: Fetal outcomes

Outcome	Number of patients	Percentage (%)
Live birth	48	48
Intrauterine fetal death	30	30
Preterm delivery	10	10
Congenital anomaly	2	2
Other adverse outcomes	10	10

These tables collectively illustrate the demographic characteristics, clinical presentation, causes, and maternal and fetal outcomes of first-trimester bleeding in this cohort. The data reflect that threatened abortion was the most common cause, and adverse outcomes slightly exceeded favorable continuation in this sample.

Bar graph 1: Causes of first trimester bleeding.
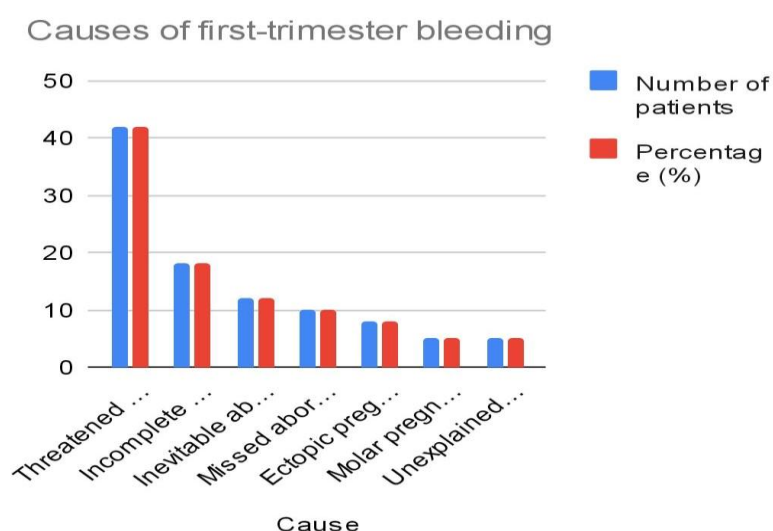
Bar graph 2: Maternal and fetal outcomes.
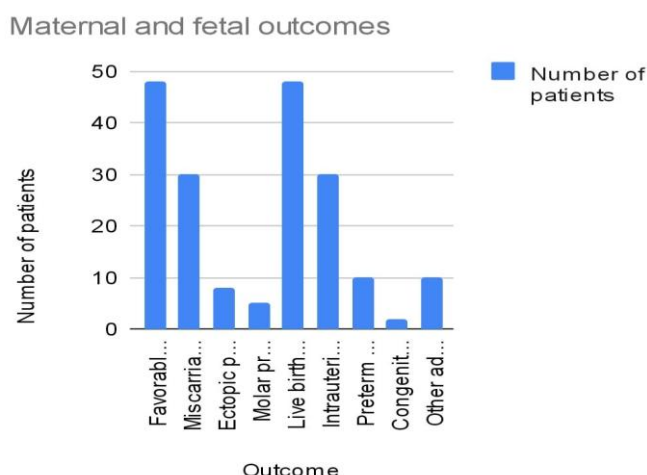
Discussion

Bleeding during the first trimester of pregnancy is a common clinical problem with multifactorial etiology and variable outcomes. In the present study, the prevalence of first-trimester bleeding

among antenatal patients at GMC Kathua was found to be 12%, which is comparable to previous reports ranging from 10% to 25% in various populations [6,7]. This highlights that early pregnancy bleeding remains a significant concern in both urban and rural obstetric populations.

The mean age of patients in this study was 26.8 ± 4.2 years, with 65% in the 21–30 years age group, reflecting the typical reproductive age for most pregnancies. This is consistent with findings by Goyal et al., who reported a similar age distribution among women presenting with first-trimester bleeding [6]. Primigravida women comprised 56% of the study population, indicating that first pregnancy may carry a slightly higher risk of bleeding or increased reporting of symptoms due to heightened vigilance and anxiety.

Threatened abortion was the most frequent cause of first-trimester bleeding (42%) in this cohort, followed by incomplete abortion (18%), inevitable abortion (12%), missed abortion (10%), and ectopic pregnancy (8%). These findings align with previous studies by Naskar et al. And Goyal et al., which reported threatened abortion as the leading cause of early pregnancy bleeding [7,6]. Ectopic pregnancy, though less common, remains a critical cause due to its potential for severe maternal morbidity and the need for timely surgical intervention. Molar pregnancy accounted for 5% of cases, reflecting the recognized prevalence of gestational trophoblastic disease in early pregnancy populations [6].

The gestational age at presentation ranged from 5–12 weeks, with the majority presenting between 7–9 weeks. This corresponds with the period of highest vulnerability for early pregnancy complications, including miscarriage and implantation-related bleeding [7]. Early evaluation of patients in this gestational window allowed for timely diagnosis and management, potentially reducing adverse maternal and fetal outcomes.

Maternal outcomes in this study showed that 48% of women had favorable continuation of pregnancy, whereas 52% experienced adverse outcomes, including miscarriage, ectopic pregnancy requiring surgery, or molar pregnancy necessitating evacuation. This is consistent with the literature indicating that nearly half of women with first-trimester bleeding may experience pregnancy loss or require intervention, particularly when bleeding is associated with pain, high volume, or abnormal ultrasound findings [6,5].

Fetal outcomes reflected a similar trend, with live births in 48% of cases and intrauterine fetal death in 30%. Preterm delivery occurred in 10%, while congenital anomalies and other adverse outcomes were observed in 12%. These results are in line with reports by Yakıştıran et al. And Siddhu et al., who demonstrated that first-trimester bleeding is a significant predictor of adverse perinatal outcomes, including low birth weight, preterm birth, and intrauterine growth restriction [7,5].

The findings of this study underscore the importance of early assessment using both clinical evaluation and ultrasonography in women presenting with first-trimester bleeding. Identification of high-risk features, including history of miscarriage, advanced maternal age, and structural uterine anomalies, allows for closer monitoring and timely intervention. Counseling regarding the potential for adverse outcomes is also essential to prepare patients and reduce anxiety associated with early pregnancy bleeding [6,7].

Regional data from GMC Kathua contribute to the understanding of prevalence, causes, and outcomes of first-trimester bleeding in North India. These results highlight that threatened abortion is the most frequent cause, and that adverse outcomes remain significant despite modern diagnostic tools and early management strategies. The study emphasizes the need for structured protocols for the evaluation and management of first-trimester bleeding in similar obstetric settings.

Conclusion

First-trimester bleeding is a prevalent and clinically significant complication of early pregnancy, with multifactorial causes and notable implications for both maternal and fetal outcomes. In this study of 100 women at Government Medical College Kathua, the most common cause of first-trimester bleeding was threatened abortion, followed by incomplete and inevitable abortions. Ectopic and molar pregnancies, though less frequent, were associated with substantial maternal risk and required timely intervention.

Maternal outcomes revealed that while 48% of pregnancies continued favorably, more than half experienced adverse outcomes including miscarriage, surgical intervention for ectopic pregnancy, or molar pregnancy requiring evacuation. Fetal outcomes mirrored maternal trends, with live births in 48% of cases, while intrauterine fetal death, preterm delivery, and congenital anomalies contributed to the remaining adverse outcomes.

Early recognition and evaluation of first-trimester bleeding, using clinical examination and ultrasonography, are essential for accurate diagnosis, risk stratification, and timely management. Awareness of high-risk factors such as advanced maternal age, previous pregnancy losses, and uterine anomalies is crucial for obstetric care providers. This study provides valuable regional data from North India and underscores the need for vigilant antenatal care, structured monitoring, and patient counseling to reduce complications and improve pregnancy outcomes.

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Funding: Nil

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