

THREATENED ABORTION IN THE FIRST TRIMESTER: MATERNAL AND FETAL OUTCOMES

Obstetrics & Gynaecology

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ABSTRACT

Background: Threatened abortion, defined by first-trimester vaginal bleeding with a viable fetus and a closed cervical OS, affects up to 15-20% of ongoing pregnancies. This study aims to evaluate maternal and fetal outcomes in women presenting with first-trimester threatened abortion and to investigate factors like sub chorionic hematoma that may predict adverse outcomes. **Methods:** A prospective observational study was conducted at the Department of Obstetrics and Gynecology, A.J. Institute of Medical Sciences and Research Centre, Mangalore, between February 2024 and September 2024. A total of 83 pregnant women aged 19-40 years with first-trimester bleeding were included, while those with IVF pregnancies, molar pregnancies, multifetal gestations, and uterine anomalies were excluded. Data on demographics, ultrasound findings, and maternal/fetal outcomes were analyzed using SPSS version 20. **Results:** Out of 83 women, 78 completed follow-up. The mean age was 28.1 years (SD $\pm$ 5.32), with a mean gestational age at the onset of bleeding of 2.5 months. Subchorionic hematoma was observed in 26.3% of cases, while placental abnormalities were present in 11.2%. Among those who continued pregnancy, 15.3% developed hypertensive disorders, 10.2% had anemia, and 0.8% had gestational diabetes. Adverse fetal outcomes included low birth weight in 32.6% and NICU admissions in 23.9%. **Conclusion:** First-trimester bleeding significantly correlates with adverse maternal and fetal outcomes, including hypertensive disorders and low birth weight. The presence of subchorionic hematoma may serve as a predictive factor, warranting careful monitoring of pregnancies complicated by early bleeding.

KEYWORDS

INTRODUCTION

Threatened abortion, characterized by vaginal bleeding during the first trimester with a closed cervix and a live fetus on ultrasound, is a significant early pregnancy complication. Occurring in up to 15-20% of all pregnancies, threatened abortion is considered a high-risk condition, often leading to increased maternal and fetal morbidity¹. Early pregnancy bleeding is associated with placental dysfunction and can result in various adverse outcomes, including preterm labor, preeclampsia, low birth weight, pre-labor rupture of membranes (PROM), and fetal growth restriction (FGR)². The maternal and fetal risks in these pregnancies underscore the importance of monitoring and intervention to mitigate potential complications.

One of the crucial ultrasound findings in first-trimester bleeding is subchorionic hematoma, an area of hemorrhage between the chorion and uterine wall. The presence of a subchorionic hematoma has been observed in up to 18% of first-trimester bleeding cases and is thought to correlate with adverse pregnancy outcomes, although the exact pathophysiological mechanisms are not fully understood³. Research by Naz et al⁴ highlights that pregnancies with subchorionic hematoma are more likely to result in complications like hypertensive disorders, preterm labor, and low birth weight, suggesting that these hematomas could be indicative of underlying placental insufficiency or inflammatory responses. Furthermore, a study by Liang et al⁵ found that subchorionic hematomas are associated with higher incidences of preterm delivery, increased need for NICU admissions, and FGR, reinforcing the potential link between early hematoma formation and adverse obstetric outcomes.

Early bleeding, especially in the presence of subchorionic hematoma, may signal impaired placental development, which can later manifest as growth restriction and other pregnancy complications. Some researchers suggest that the size and location of the hematoma might influence outcomes, though current evidence remains inconclusive^{6,7}. Studies by Palatnik and Grobman⁸ have attempted to quantify the risk associated with hematoma size and cervical length, proposing that larger hematomas and shorter cervical length in the first trimester may be predictive markers of preterm birth and other complications. However, the variability in study results highlights the need for further investigation to solidify the relationship between hematoma characteristics and pregnancy outcomes.

Given the substantial morbidity associated with first-trimester bleeding, this study aims to examine maternal and fetal outcomes in

pregnancies complicated by threatened abortion. By focusing on the presence of subchorionic hematoma and its potential role in predicting adverse outcomes, this study seeks to contribute to a more comprehensive understanding of early pregnancy bleeding and its implications on the course of pregnancy

AIM AND OBJECTIVES

AIM:

To assess the association between first-trimester threatened abortion and subsequent maternal and fetal outcomes.

OBJECTIVES:

1. To evaluate maternal outcomes in patients with first-trimester bleeding.
2. To assess fetal outcomes, specifically birth weight and NICU admission rates.
3. To analyze ultrasound findings, with a particular focus on subchorionic hematoma, and their relationship with pregnancy outcomes.

METHODOLOGY

Study Design: Hospital-based prospective observational study.

Study Setting And Period: Conducted at the Department of Obstetrics and Gynecology, A.J. Institute of Medical Sciences and Research Centre, Mangalore, from February 2024 to September 2024.

Sample Size And Technique: A total of 83 pregnant women who presented with first-trimester bleeding were recruited. Convenience sampling was employed.

Inclusion Criteria:

- Pregnant women aged 19-40 years.
- Viable intrauterine pregnancy as confirmed by ultrasound.
- Pregnant women presented with bleeding/spotting pervaginum along with pain abdomen within 14 weeks of gestation.

Exclusion Criteria:

- IVF pregnancies, multifetal gestations, molar pregnancies, uterine anomalies, and those lost to follow-up.

Data Collection:

Data included demographics, clinical presentation, ultrasound findings, and outcomes. Outcome data included maternal complications, delivery method, and neonatal parameters, such as

birth weight and NICU admission.

Statistical Analysis:

Data were analyzed using SPSS version 20, with categorical variables expressed as frequencies and percentages, and numerical variables as mean ± SD. Chi-square test was used to examine associations, with statistical significance set at p < 0.05.

RESULTS

During the 8-month study period from February 2024 to September 2024, a total of 83 pregnant women who presented with threatened abortion in the first trimester were recruited and followed. Out of these, 5 women were lost to follow-up, resulting in a final sample size of 78.

Demographic Characteristics

Demographic characteristics	Mean	Standard deviation
Age (years)	28.1	5.32
Gestational age (weeks)	25.16	13.5
Gestational age of 1 st bleeding (months)	2.5	0.4

Mean Age: 28.1 years (SD = 5.32)

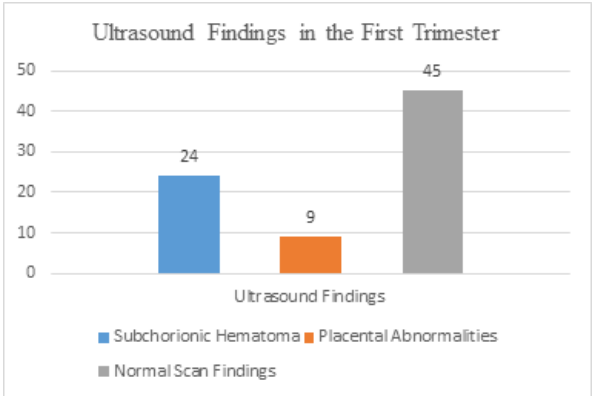
Mean Gestational Age at Enrollment: 25.16 weeks (SD = 13.5)

Mean Gestational Age at First Episode of Bleeding: 2.5 months (SD = 0.4)

The cohort consisted of 38 (48.7%) primigravida women and 40 (51.3%) multigravida women.

Ultrasound Findings in the First Trimester

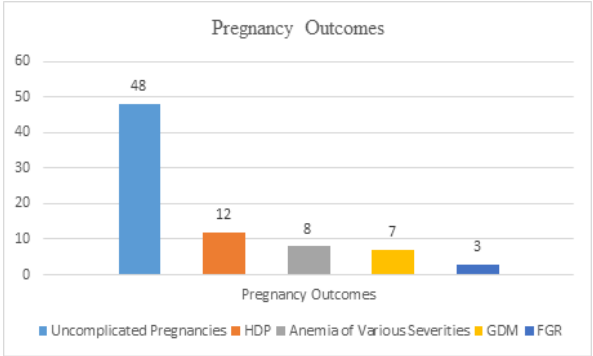
- Subchorionic Hematoma: Observed in 24 women (26.3%)
- Placental Abnormalities: Detected in 9 women (11.2%)
- Normal Scan Findings: Observed in 45 women (57.6%)



Pregnancy Outcomes

Among the women who continued with their pregnancies, the following complications were observed:

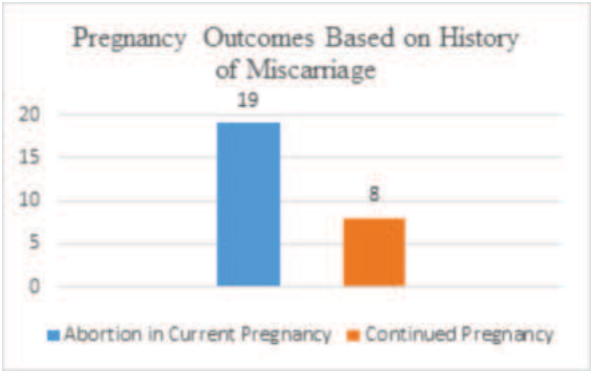
- Uncomplicated Pregnancies: 48 women (62.2%)
- Hypertensive Disorders in Pregnancy (HDP): 12 women (15.3%)
- Anemia of Various Severities: 8 women (10.2%)
- Gestational Diabetes Mellitus (GDM): 7 women (8.9%)
- Fetal Growth Restriction (FGR): 3 women (3.8%)



Pregnancy Outcomes Based on History of Miscarriage

Among women with a prior history of miscarriage:

- Abortion in Current Pregnancy: 19 women (57.9%)
- Continued Pregnancy: 8 women (42.1%)



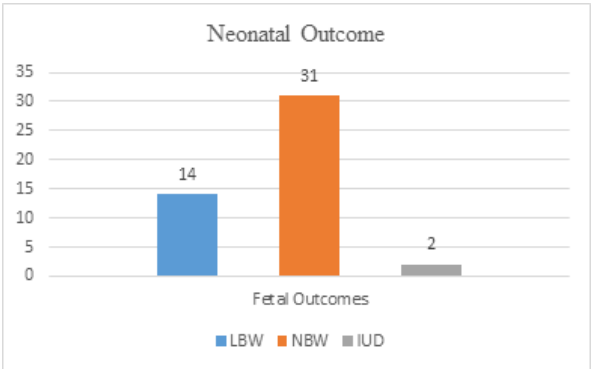
First Trimester Complaints and Associated Pregnancy Outcomes

1st trimester Complaints	Mode of delivery						Total	Chi square and P value
	Abortion	PTVD	FTVD	Elective LSCS	Emergency LSCS	IUD		
Bleeding PV	20	5	14	1	9	1	50	Chi square test -17.94 P value-0.606
	85.0%	20%	53.3%	9.1%	35%	3.3%		
Pain abdomen	3	1	1	2	1	0	8	
	42.9%	14.3%	14.3%	28.6%	9.1%	0.0%		
Pain abdomen with bleeding PV	9	1	2	3	5	0	20	
	45.5%	9.1%	28.2%	29.1%	48.4%	0.0%		

Neonatal Outcomes

Among the 46 women who delivered either by normal vaginal delivery or LSCS:

- Low Birth Weight (LBW) (<2.5 kg): 14 cases (32.6%)
- Normal Birth Weight (2.6 kg to 4 kg): 31 cases (67.4%)
- Intrauterine Death (IUD): 1 case (2.2%)



Additionally, 11 neonates (23.9%) required admission to the neonatal intensive care unit (NICU) post-delivery.

These results underscore the significant risks associated with threatened abortion in the first trimester, including higher rates of hypertensive disorders, anemia, gestational diabetes, preterm labor, and NICU admissions. Subchorionic hematoma, seen in a notable proportion of cases, may contribute to adverse outcomes, although its precise impact warrants further investigation.

DISCUSSION

The findings of this study substantiate the established association between threatened abortion and various adverse obstetric outcomes, as demonstrated in prior research. The high rates of hypertensive disorders and preterm labor found among patients with first-trimester bleeding align closely with the work of Sarmalkar et al⁹, who also reported an increased incidence of these complications. Furthermore, Siddu et al¹⁰ highlighted that pregnancies complicated by first-trimester bleeding were more prone to adverse neonatal outcomes, including higher NICU admission rates and low birth weights, emphasizing the impact of early bleeding events on pregnancy trajectories.

Subchorionic hematoma has emerged as a key factor in understanding the risks associated with threatened abortion. This study found a 26.3% incidence of subchorionic hematoma, paralleling findings by Hanif et al¹¹, who reported that the presence of a subchorionic hematoma

significantly increased the risk of miscarriage and adverse fetal outcomes. Additionally, studies by Wardinger et al¹² emphasize that subchorionic hematoma may disrupt normal placental development, potentially through mechanisms involving inflammatory responses or vascular compromise, which can compromise nutrient delivery to the fetus. This mechanism supports the heightened risk of FGR, low birth weight, and other complications often associated with subchorionic hematoma.

Research on hematoma size and location adds further dimension to the prognostic potential of ultrasound findings in early pregnancy. Palatnik and Grobman⁸ reported that the presence of a subchorionic hematoma, especially in combination with a shortened cervical length on ultrasound, correlated with higher incidences of preterm birth and adverse outcomes. This is consistent with recent work by Nagy et al¹³, who found that larger hematomas were associated with a greater likelihood of preterm labor and preeclampsia, suggesting that the extent of hematoma involvement might directly affect placental function.

Maternal complications such as hypertensive disorders and anemia, frequently noted in this study, likely stem from compromised placental function initiated by early pregnancy bleeding. The connection between first-trimester bleeding and hypertensive disorders, such as preeclampsia, may reflect placental insufficiency that persists throughout pregnancy. This hypothesis is reinforced by studies like those by Raghupathy et al, which suggest that suboptimal placental perfusion and abnormal placentation are primary contributors to these complications. Anemia, another observed maternal complication, may be exacerbated by underlying placental dysfunction, potentially due to the altered hemodynamic demands associated with early pregnancy bleeding¹⁴.

Additionally, NICU admission rates and low birth weights observed in cases with early bleeding align with findings from Bever et al¹⁵, who found that even mild first-trimester bleeding episodes correlated with adverse neonatal outcomes. Such evidence supports the hypothesis that early bleeding events could compromise fetal health and growth potential by affecting the placental environment and nutrient availability. This study's observed rates of low birth weight and FGR further reinforce this theory, indicating that early intervention and monitoring for pregnancies complicated by threatened abortion may be warranted to improve neonatal outcomes.

In summary, this study adds to the body of evidence linking threatened abortion with adverse obstetric and neonatal outcomes. The findings support the hypothesis that early pregnancy bleeding, especially in the presence of subchorionic hematoma, could indicate underlying placental dysfunction with lasting effects. Future research should explore the predictive value of hematoma size, location, and cervical length as early markers to guide monitoring and intervention, with the goal of optimizing maternal and fetal health outcomes in high-risk pregnancies.

CONCLUSION

First-trimester vaginal bleeding, often indicative of threatened abortion, is associated with significant maternal and fetal risks. This study highlights the role of ultrasound in identifying key risk factors, particularly subchorionic hematomas, which were observed in 26.3% of pregnancies complicated by early bleeding. Subchorionic hematomas have been linked to adverse outcomes such as miscarriage, fetal growth restriction (FGR), low birth weight, and higher NICU admission rates, suggesting a potential impact on placental health and function. However, the association between hematoma size, location, and adverse outcomes remains incompletely understood, warranting further study to refine the prognostic value of these parameters.

A prior history of miscarriage was also identified as a critical predictor, with 19 of 32 women experiencing abortion having had previous miscarriages, emphasizing the need for vigilant monitoring and tailored care in high-risk pregnancies. Additionally, maternal complications like hypertensive disorders and anemia were frequently noted, suggesting that early pregnancy bleeding may initiate placental insufficiency and hemodynamic disruptions, persisting throughout gestation.

Neonatal outcomes, including low birth weight and NICU admission, were commonly associated with early bleeding, aligning with existing

literature linking even mild first-trimester bleeding to adverse fetal outcomes. This supports the hypothesis that early bleeding events could compromise placental function, underscoring the importance of early detection, monitoring, and standardized protocols to mitigate risks.

In conclusion, first-trimester bleeding in threatened abortion, especially in the presence of subchorionic hematomas, signals an increased risk for both maternal and fetal complications. Ultrasound plays a critical role in assessing pregnancy viability, placental location, and hematoma presence, offering valuable predictive insight. Further research into hematoma characteristics, such as size and location, along with cervical length, could enhance predictive accuracy and guide early interventions, ultimately optimizing outcomes for both mothers and their infants.

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