

A Study of Feto-Maternal Outcomes in First Trimester Bleeding Per Vaginum: A Prospective Observational Study

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Abstract:

Background: The present study investigating the relation between vaginal bleeding and adverse maternal and perinatal outcomes in singleton pregnancies in a group of patients with complain of vaginal bleeding in the first trimester.

Methods: An observational study with 160 participants from Agartala Government Medical College & G.B.P. Hospital, conducted over 18 months from March 2021 to August 2022, examined cases of vaginal bleeding in early pregnancy. Participants were followed up until delivery, with outcomes categorized into nonviable (abortions, ectopic, molar pregnancies), viable and neonatal outcomes.

Results: Most participants were aged 19-24 years (72.5%) and over half were multi gravida (52.5%). First-trimester non-viable pregnancies were primarily abortions (53.75%). Most of the viable pregnancies continued to term (53.45%), often resulting in vaginal delivery (60.0%). Complications included placenta previa (12.07%), preterm labor (10.34%), and least commonly, IUGR (1.72%). Common neonatal issues included low birth weight (38.18%), with stillbirths in (3.45%) and early neonatal deaths in (10.91%) neonates.

Conclusions: Bleeding in the first trimester poses risks for both mother and baby. Obstetricians must remain vigilant, recognizing it as a potential harbinger of adverse outcomes. Tailored management strategies and comprehensive prenatal care can mitigate risks, ensuring better pregnancy outcomes and informed decision-making.

Keywords: Abortions, First trimester bleeding, Pre-term labor, Threatened abortion.

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Introduction

First trimester is a dynamic period which spans fertilization, implantation and organogenesis. Bleeding in the first trimester is a common obstetric entity complicating 16-25% of all pregnancies [1]. Uterine bleeding in early pregnancy represents a definite threat to developing embryo and causing stress and anxiety for the expectant mother and the clinician about the outcome of pregnancy.

A variety of factors leading to bleeding in the first trimester, ranging from both obstetrical and non-obstetrical causes. The primary contributing causes consist of different types of abortions (threatened, inevitable, complete, incomplete and missed), gestational trophoblastic disease, ectopic gestation, implantation bleeding. In pregnancies experiencing bleeding in first trimester, less than 50% progress

without complications beyond 20 weeks of gestation. Approximately 16% of women are diagnosed with ectopic pregnancy [2], while 0.1-0.2% may involve a hydatidiform mole [3]. Spontaneous abortion occurs in 8-20% of pregnancies; with 80% of these occurring in the first trimester [4]. Threatened abortion affects at least 20% of all pregnancies [5] and can continue, associated with an increased risk of adverse maternal outcomes such as placenta previa, abruptio placenta, manual removal of placenta, caesarean delivery and poor perinatal outcomes such as preterm birth, preterm ruptured membranes, low birth weight infants, fetal growth restriction fetal and neonatal death [6].

Objective:-

To determine the maternal and neonatal outcomes in the patients experiencing bleeding per vaginum in the first trimester

Materials and Methods

An observational study was conducted involving 160 participants attending the department of obstetrics and gynecology at Agartala Government Medical College & G.B.P. Hospital, Tripura. The study was conducted over the period of 18 months from March 2021 to August 2022.

Study Design: Observational cross sectional study

Study Populations: Pregnant women attended gynecology OPD and labour room with the complaint of bleeding per vagina in less than 12 weeks.

Sample size calculation:

- N= Number of patients
- P = prevalence = from previous study, prevalence of 1st trimester bleeding is 16-25%ⁱ
- $Q = (100 - P) = (100 - 16) = 84$
- Z= 1.96 at 95% confidence interval
- D= 6% (absolute precision)

Calculation of sample size done with precision/ absolute error 6%,

$$N = Z^2 PQ / D^2$$

$$N = (3.84 \times 16 \times 84) \div 0.0036$$

$$N = 144.$$

Thus, N comes out as 144. Taking 10% nonresponsive rate, the study was conducted on N = 144 + 15 ~ 160 patients with bleeding per vaginum.

Sampling Technique: Consecutive sampling

Inclusion Criteria:

- a. Women with pregnancy test positive
- b. Pregnancy with vaginal bleeding less than 12 weeks of period of gestation

Exclusion Criteria:

- a. Women with more than 12 weeks of gestation.
- b. Women opting for termination of pregnancy
- c. Women with medical disorders e.g. DM, Hypertension, Coagulopathy
- d. All non-obstetrical causes of vaginal bleeding.

Statistical Analysis: Data entry and analysis were performed on a computer using SPSS software version 21.0. Data were expressed as charts, tables and bar graphs. Continuous variables were expressed as mean \pm standard deviation.

Procedure: In this study, bleeding per vagina cases were examined from early in the first trimester and followed up until the end of pregnancy. Following enrollment, a comprehensive initial interview was

followed by subsequent interviews throughout pregnancy. In case of miscarriage before a scheduled interview, the interview was conducted promptly after pregnancy loss. After clinical evaluation, subjects underwent ultrasonography.

Nonviable pregnancies confirmed by ultrasound were terminated. Ectopic pregnancies received definitive treatment and molar pregnancies underwent suction and evacuation. Viable pregnancies were followed up through regular antenatal checkups. Outcome data were collected from regular ANC, telephone interviews and follow up examination. The following outcome was categorized:

1. Nonviable outcomes
 - a. Abortions – inevitable, incomplete, complete, missed abortion
 - b. Ectopic pregnancy
 - c. Molar pregnancy
2. Viable outcomes
 - a. Obstetrical outcomes
 - i. Second trimester pregnancy loss (abortion)
 - ii. Preterm labor
 - iii. Antepartum hemorrhage (Placenta previa and Abruptio placenta)
 - iv. Hypertensive disorder of pregnancy
 - v. Rupture of Membrane
 - vi. Intrauterine Growth restriction
 - vii. Intrauterine Fetal Death
 - viii. No complications
 - b. Delivery outcomes
 - i. Instrumental delivery by forceps or vacuum
 - ii. Caesarean delivery
3. Neonatal outcomes
 - a. Preterm Baby
 - b. Still Birth
 - c. Early Neonatal Death
 - d. Low Birth Weight
 - e. Apgar score <7 at 5 Minutes
 - f. Admission to NICU

For all these patients, a detailed clinical study was taken including investigations according to the proforma. They have been given the required treatment in antenatal period and were admitted in the hospital as and when necessary.

Results

In this study 160 women with vaginal bleeding in the first trimester of their pregnancy were studied. The study population mostly consisted of patients aged between 19 and 24 years (39.37%), followed by patients aged between 25 and 29 years (27.5%).

Table 1: Age group wise distribution of Study population (n=160)

Age Groups (years)	Frequency	Percent
≤19	20	12.5
20-24	63	39.37
25-29	44	27.5
30-34	24	15
≥35	9	5.63
Total	160	100

Most of the study population was Multigravida (52.5%). Primigravida comprised of 76 individuals, with a proportion of less than half (47.5%) (Table 2)

Table 2: Distribution of study population based on Gravida (n=160)

Gravida	No of cases	Percent
Primi-gravida	76	47.5
Multi-gravida	84	52.5
Total	160	100.0

First trimester bleeding in the study population was mostly (38.1%) reported between 6 and 9 weeks of gestation, followed by bleeding at more than 9 weeks (35.6%) of gestation (Table3)

Table 3: Distribution of the study population based on gestational Age (n=160)

Weeks at Bleed (upto 12 weeks)	No. of cases	Percent
<6	42	26.3
6-9	61	38.1
>9	57	35.6

All the pregnant women of first trimester bleeding were undergone ultrasound confirmation. Viable pregnancy considered as threatened abortion and was found in 58 (36.25%) cases and nonviable pregnancies were found in 102 (63.75%) cases (Table 4). In patients, where USG confirmed a non-viable pregnancy, most were first trimester abortions (53.75%), followed by ectopic pregnancy (8.12%) and molar pregnancy (1.87%) (Figure 1).

Table 4: Outcome of pregnancy among the pregnant women with first trimester bleeding (n=160)

USG finding	No. of cases	Percentage
Viable pregnancy	58	36.25
Non-viable pregnancy	102	63.75
Total	160	100.0

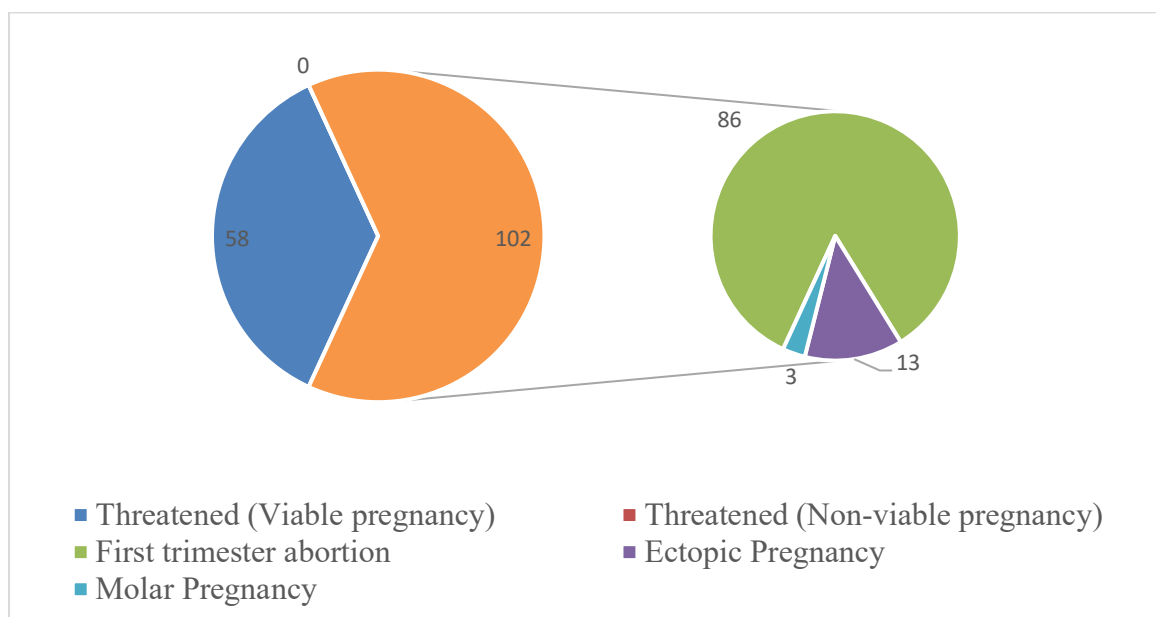


Figure 1: Pie in pie chart showing the distribution of USG findings (n=160)

Bleeding was mostly heavy in those patients who had non-viable pregnancies 60 (58.82%), whereas, those who had viable pregnancies, bleeding were mostly classified as spotting 39 (67.24%) (Figure 2).

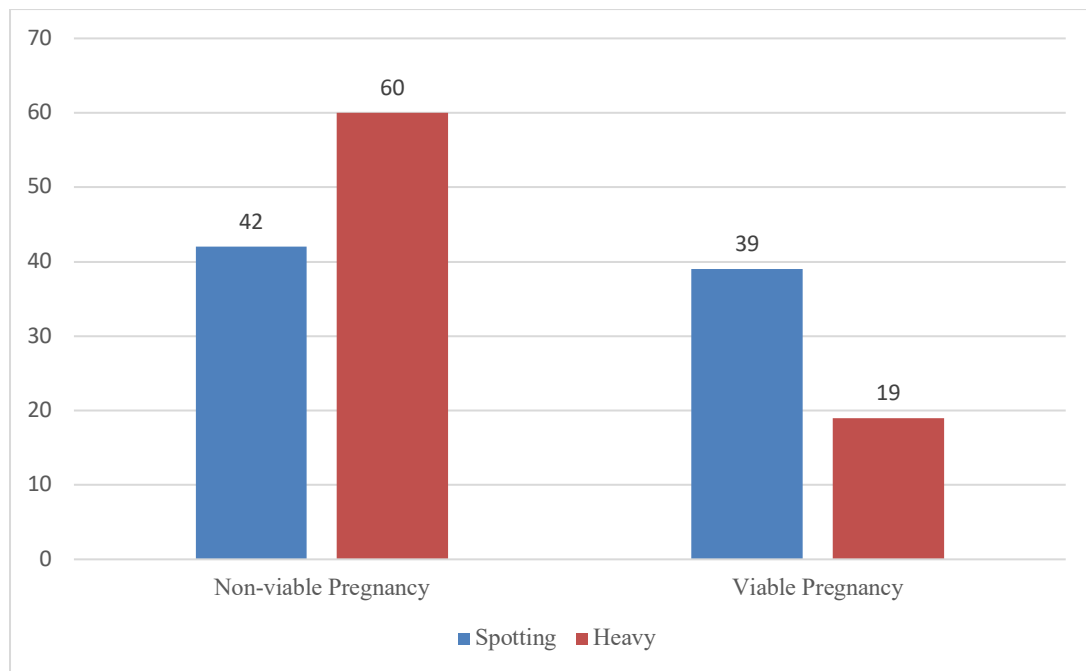


Figure 2: Compound bar diagram showing the Pattern of bleeding (n=160)

Of the pregnancies with non-viable fetus following bleed, most had incomplete abortions (31.37%), followed by complete abortion (25.49%). Molar pregnancies were seen the least (2.94%) (Table 5)

Table 5: Distribution of non-viable pregnancies in early trimester (≤ 12 weeks) confirmed by USG

Pregnancy Outcomes	No. of cases	Percent
Inevitable abortion	9	8.82
Incomplete abortion	32	31.37
Complete abortion	26	25.49
Missed abortion/Blighted ovum	19	18.63
Ectopic pregnancy	13	12.75
Molar pregnancy	3	2.94

Of all the viable pregnancies confirmed by USG, most of the pregnancies continued to term (53.45%). Of those that had complications, Placenta previa had the highest proportion (12.07%), followed by preterm labour (10.34%). IUGR was seen in the least cases (1.72%) (Table 6).

Table 6: Distribution of Maternal Outcome (viable pregnancies in early pregnancy)

Maternal Outcome	No. of cases	Percent
Second trimester pregnancy loss (abortion)	3	5.17
Preterm Labour	6	10.34
Rupture of Membrane	3	5.17
Placenta Previa	7	12.07
Abruption Placenta	2	3.45
Pregnancy Induced Hypertension	3	5.17
Intrauterine Growth Restriction	1	1.72
Intrauterine Fetal death	2	3.45
Continuation of pregnancy upto Term	31	53.45

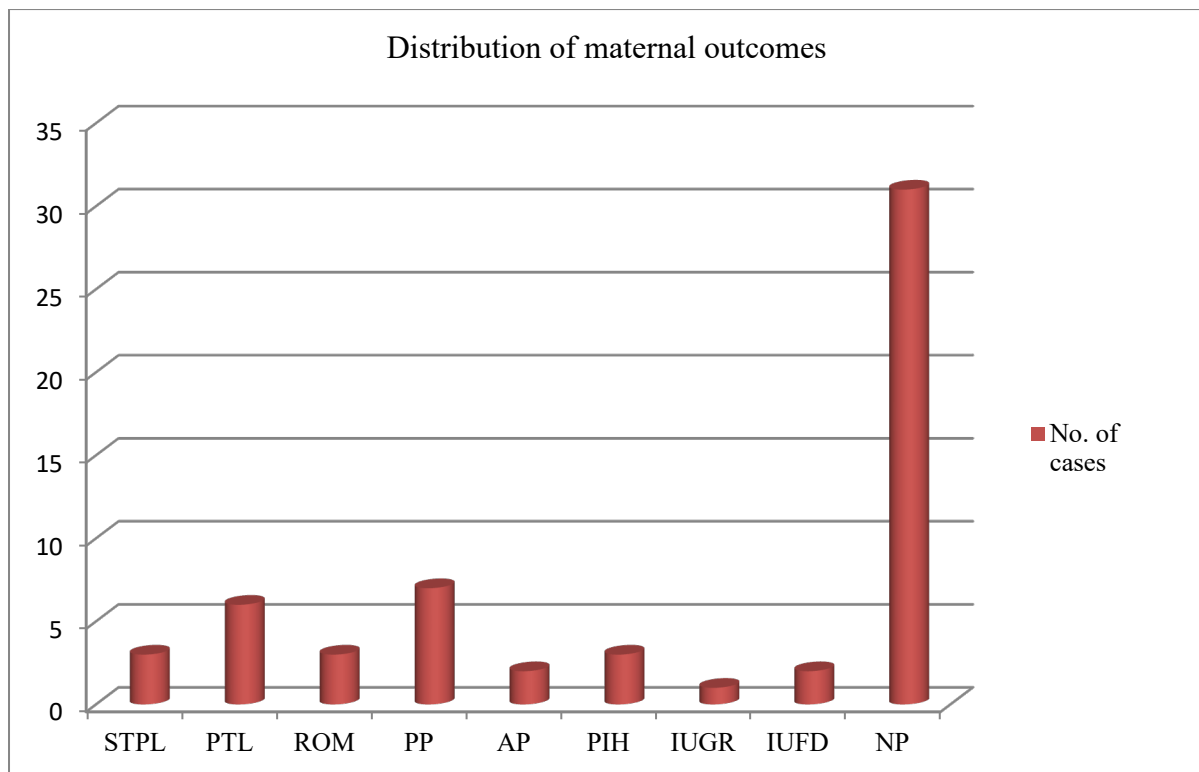


Figure 3: Bar diagram showing the distribution of Maternal Outcome (viable pregnancies in early pregnancy)

STPL- Second trimester pregnancy loss, PTL- Preterm Labour, ROM- Rupture of Membrane, PP- Placenta Previa, AP- Abruptio Placenta, PIH- Pregnancy Induced Hypertension, IUGR. Intrauterine Growth Restriction, IUFD- Intrauterine Fetal death, NP- Continuation of pregnancy upto Term. Vaginal delivery was performed in most of the study population with viable pregnancies, (60.0%), followed by Caesarean Section (30.91%) (Table 7)

Table 7: Distribution of delivery Outcome (viable pregnancies in early pregnancy crossed ≥ 28 weeks)

Delivery Outcome	No. of cases	Percent
Vaginal birth	33	60
Instrumental delivery	5	9.09
Caesarean Section	17	30.91

Among the vaginal and assisted vaginal deliveries, manual removal of placenta is needed in 2 (5.26) cases and postpartum hemorrhage occurred in 6 (10.91) cases across all deliveries.

Among the viable pregnancies mostly 37 (63.79%) carried beyond 37 weeks. Among those that did not carry beyond 37 weeks, greatest proportion of deliveries occurred between 34 and 37 weeks 9

(15.52%), followed by 32 and 34 weeks 6 (10.34%) and 3 (5.17) cases between 28 to 32 weeks.

The most prevalent complication reported in the neonatal study population was an APGAR score of less than 7 at 5 minutes (41.82%), followed by low birth weight (38.18%). Still birth was seen in 2 cases, and early neonatal Death was seen in 6 neonates (Table 8).

Table 8: Distribution of neonatal Outcome

Neonatal Outcome	No. of cases	Percent
Preterm baby	18	32.73
Still birth	2	3.64
Low birth weight	21	38.18
APGAR score <7 at 5 min	23	41.82
Admission to NICU	15	27.27
Early neonatal death	6	10.91

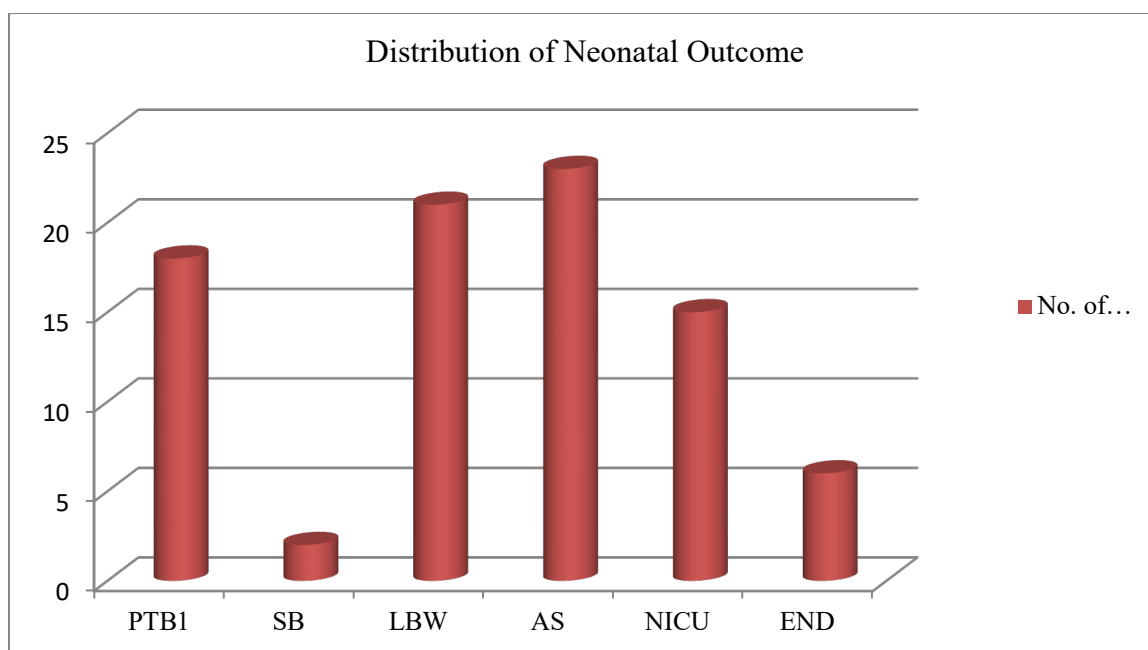


Figure 4: Bar diagram showing the distribution of neonatal outcome

PTB1- Preterm baby, SB- Still birth, LBW- Low birth weight, AS- APGAR score <7 at 5 min, NICU- Admission to NICU, END- Early neonatal death.

Discussion:

First-trimester bleeding is not only associated with miscarriage but also with a higher rate of pregnancy complications. Bleeding during first trimester has been seen to be associated with an increased risk of preterm delivery.[7] Because of impaired implantation and invasive trophoblasts, spontaneous abortion may occur in early pregnancy while preterm delivery, PPRM, placental abruption and preeclampsia may happen in later period. Several studies have reported the association between vaginal bleeding in first trimester and the adverse maternal and perinatal outcomes which includes abortion, preterm labour, low birth weight and intra uterine growth

restrictions. Most of these studies were retrospective, while the present one was a prospective one generating more robust data. In the current study, of the viable pregnancy was seen in 36.25% while non-viable pregnancy was noted in 63.75%. Among the non-viable pregnancy (n=102) USG revealed that most were incomplete abortions (31.37%), followed by complete abortions, (25.49), missed abortions or blighted ovum (18.63%), inevitable abortions (8.82%), ectopic pregnancy (12.75%) and molar pregnancy (2.94%). Bhatu et al, [8] reported all forms of abortion (missed, incomplete, inevitable and blighted ovum) in 64.5% of non-viable pregnancy outcome in their reporting cohort. Reddirani et al, [9] reported 61% abortion. Kamble et al [10], showed that of all patients who aborted missed abortion (48.70%), subchorionic hematoma (7.70%), complete abortion (11.3%) and incomplete abortion (28.20%) (Table 9)

Table 9: Distribution of non-viable pregnancies

	Bhatu et al (%)	Reddirani et al (%)	Kavyashree et al (%)	Present study (n=160) (%)
Abortions (Non-viable)	43.6	55.76	61.5	52.5
Ectopic	5.45	13	4	8.13
Hydatiform mole	1.81	4	2.5	1.88

Of all the viable pregnancies confirmed by USG, most of the pregnancies continued to term (53.45%). Of those in the study that had complications, placenta previa (12.07%), preterm labour (10.34%), PROM, hypertensive disorder of pregnancy and second trimester abortion (5.17%), abruptio placenta and IUFD (3.45%) and IUGR (1.72%) were seen in decreasing frequency. Bhatu et al [11], observed that 20.7% of such cases had

preterm delivery, 8.6% had IUGR. They also reported anemia (31%), placenta previa (2.8%), placenta abruption (8.5%), PPRM (20%) and PIH (8.5%) in their study population. Hence, significant maternal morbidities are associated with patients who had bleeding per vaginum in their first trimester. Thus, bleeding per vaginum can prognosticate the complications in the pregnancy. Kamble et al [12], on the other hand, reported

preterm labour in most (15.3%), PROM (6.75%), APH (1.8%) and 2nd trimester abortion (1.8%).

Table 10: Distribution of obstetrical outcomes

complications	Kamble et al (%)	Bhatu et al (%)	Davari-Tanha et al (%)	Sonal et al (%)	Present study (%)
Second trimester pregnancy loss (abortion)	1.8	4.2	-	-	5.17
Preterm Labour	15.3	-	52.9	27	10.34
Rupture of Membrane	6.75	20	27.5	9	5.17
Placenta Previa	1.8	2.8	0.6	-	12.07
Abruptio Placenta		8.5	5.7	11	3.45
Hypertensive Disorder of Pregnancy	5.5	8.5	4.6	-	5.17
Intrauterine Growth Restriction	-	1.4	3.4	0.5	1.72
Intrauterine Fetal death	-	1.4	14.1	1.5	3.45
Uncomplicated pregnancy	68.7	-	-	16	53.45

Vaginal delivery was performed in most (60%) of the study population with viable pregnancies, in the present study and in other studies. Saraswat et al, [13] performed a systematic review and demonstrated that first trimester bleeding has no effect on route of delivery. But some other studies have shown that possibility of caesarean section in

women with bleeding is more than others. In their prospective study of associated risk factors and fetomaternal outcome in 300 mothers, with first trimester bleeding, in a tertiary care hospital, Lewis et al [14], reported that 28.86% mothers underwent LSCS, similar to studies by Davari-Tanha et al (28%). [15]

Table 11: Distribution of Mode of delivery

	Kavyashree et al (%)	Davari-Tanha et al (%)	Bhatu et al (%)	Lewis et al (%)	Present Study (%)
Vaginal Delivery/ Vaginal delivery + instrumental vaginal delivery	81	57.2	62	71.14	69.09
Caesarean Delivery	19	42.8	38	28.86	30.91

In the present study, still birth was seen in 3.45 cases, and early neonatal Death was seen in 10.91 neonates.

In their study, Saraswat et al, [16] reported perinatal mortality in 2.06%, similar to Sipila P (1.11%) et al, [17] Wijesiriwardana A (1.5%) et al [18], and Mulik V (2.11%) et al [19] studies. As

reported by Amirkhani Z et al [20], which also had an incidence of 1.7% in women with first trimester vaginal bleeding. Perinatal death was 6.49%, out of which 80% were still births due to abruptio placenta and rest 20% was early neonatal death within 1 week of NICU admission due to preterm IUGR, in their study by Bhattu et al [21].

Table 12: Distribution of neonatal Outcome

Outcome	Patel NG et al (%)	Sonal et al (%)	Mulik V et al (%)	Wijesiriwardana A et al (%)	Present Study (%)
Preterm baby	21.9	27	28.8	-	32.73
Still birth	-	1.5	-	-	3.64
Low birth weight	35.9	-	-	-	38.18
Admission to NICU	30.3	15	-	-	27.27
Early neonatal death	9.4	-	2.11	1.5	10.91

This result suggest that women who are having first trimester threatened abortion, if given proper antenatal care and by routine ultrasound and regular follow up and specific management, they can deliver a live term baby without any complications.

Conclusion:

Bleeding in the first trimester of pregnancy is a significant concern, with implications for both maternal and fetal health. Early detection through

ultrasound is crucial for distinguishing viable pregnancies and guiding treatment decisions. Obstetricians should consider first trimester bleeding as a potential indicator of adverse outcomes such as placenta previa, preterm labor, and fetal growth restriction.

Providing appropriate counseling and support to patients is essential, along with comprehensive prenatal care to mitigate risks.

Identifying high-risk individuals allows for tailored management strategies, potentially improving pregnancy outcomes and facilitating informed decision-making for delivery. This knowledge aids in counseling women and alerting clinicians to potential complications.

Limitations:

The study is a hospital-based study involving only one tertiary institute.

The demographic profiles in our study may not be representative of the actual demographic distribution in the community.

Only a small sample size was used for the study, thereby limiting generalizability of the findings. Amount of bleeding and characteristics had subjective variation.

Ethical approval:

The present study was approved by the Institutional Ethics Committee for clinical studies of Agartala Government Medical College. Ref. No. 4 (5-244)/AGMC/Academic/IEC certificate/ 2021/7168.

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