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## Original Research Article

# Indentification of the causes of first trimester vaginal bleeding and fetomaternal outcomes in cases with threatened abortion

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## ABSTRACT

**Background:** A pregnancy may end in a live birth, a spontaneous miscarriage (spontaneous abortion), an induced abortion, or a stillbirth. Approximately one-fourth of women will have first-trimester bleeding, and about half of those women will have a spontaneous abortion and approximately 50% will continue with a normally progressing pregnancy. First-trimester bleeding leads to pregnancy loss in over 50% of cases.

**Objective:** To identify the various causes of first trimester vaginal bleeding.

To determine maternal and fetal outcomes in patients with threatened abortion.

**Materials and Methods:** This prospective observational study was carried out on the pregnant females who present to our tertiary care hospital with first trimester vaginal bleeding over a time period of 15 months (January 2023-March 2024) and met the inclusion criteria. Total of 133 females were enrolled in the study out of which 31 lost to follow up. Data of 102 females was collected and results were compiled. Patients of threatened abortion were followed up for maternal and perinatal outcomes.

**Results:** Majority 41(40.20%) of the cases in the study were of 26 -30 years age group with mean gestational age of 9.52+/- 2.76 weeks. 51.96% cases were threatened abortion followed by 18.62% cases missed abortion, 13.72% cases incomplete abortion, 7.85% ectopic pregnancy, 3.92% complete abortion, 2.51% inevitable abortion and one (0.98%) case of molar pregnancy. Cases of threatened abortion were followed for outcome and preterm labour was seen in 49% cases, PROM in 35.8%, placenta previa in 20.7%, abruptio placenta in 13.2%, PIH in 11.3%, IUFD in 7.574%, second trimester complete abortion in 6.7% and PPH in 3.8%. Out of total 46 live babies 27(58.69%) had low birth weight. 31(67.39%) had APGAR score above seven at 1 min while 15 cases (32.61%) had below seven and also required NICU admission.

**Conclusion:** Patients presenting with first trimester bleeding should be categorized as high risk patients and be monitored actively during antenatal period with appropriate management strategies in place. In light of various research findings, it is evident that there is merit in conducting further investigations to identify the most reliable predictors of adverse pregnancy outcome in women experiencing first trimester vaginal bleeding.

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## 1. Introduction

Pregnancy and childbirth are the significant events in a woman's life which accord her the status of motherhood. Pregnancy can be a time of great hope and blissful

expectations. However in certain cases it can be a period of terror, pain and even death. Pregnancy is a physiological process when one or more off springs develop inside a woman's womb. A pregnancy may end in a live birth, a spontaneous miscarriage (spontaneous abortion), an induced abortion, or a stillbirth.

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About 25% of women will have first-trimester bleeding, and about half of those women will have a spontaneous abortion and approximately 50% will go on to have a normal pregnancy. Meta-analysis suggests that the first trimester vaginal bleeding doubles the risk of other pregnancy complications.<sup>1</sup> Major causes of first trimester bleeding are miscarriage (threatened, inevitable, complete or incomplete), ectopic pregnancy, implantation bleeding, molar pregnancy and cervical pathology.<sup>2</sup> The risk of impending abortion increases with maternal age, systemic disorders like hypothyroidism and diabetes mellitus, infertility treatments, maternal weight, thrombophilia, and uterine anatomical abnormalities.<sup>3,4</sup> First-trimester bleeding leads to pregnancy loss in over 50% of cases. Threatened miscarriage is identified in presence of fetal cardiac activity on ultrasonography with complain of bleeding per vaginum with closed cervical os on examination. Bleeding per vaginum during early pregnancy may be related to poor foeto-maternal outcomes.<sup>5</sup> Potential adverse outcomes include preterm premature rupture of membranes (PPROM), preterm delivery (PTL), placental abruption, intrauterine growth restriction (IUGR), and pre-eclampsia.<sup>6,7</sup> It is hypothesized that first trimester bleeding may indicate an underlying placental dysfunction which may manifest later on in pregnancy causing adverse pregnancy outcomes as mentioned earlier.<sup>5</sup> Comprehensive understanding about pregnancy outcome following 1<sup>st</sup> trimester vaginal bleeding is important not only to pregnant mothers, but also to the obstetrician treating her; to plan adequate antenatal care and timely intervention to reduce the maternal and perinatal complications. To evaluate adverse fetal outcomes following first trimester vaginal bleeding, several studies have been attempted, but a couple of them have remarked on adverse maternal outcome.

This study aimed to find out the various causes of first trimester vaginal bleeding and to evaluate the foeto-maternal outcome in threatened abortion in the pregnant females.

## 2. Materials and Methods

### 2.1. Study design

Prospective observational study.

### 2.2. Study period

This study was conducted from January 2023 to March 2024.

### 2.3. Inclusion criteria

Pregnant female presenting in the OPD or emergency services with first trimester vaginal bleeding or spotting who gave consent for participation in this study.

### 2.4. Exclusion criteria

1. Any patient with chronic hypertension
2. Any patient with overt diabetes mellitus
3. Any patient with coagulopathies
4. Any patient on anticoagulant drugs
5. Any patient with history of hypertensive disorder of pregnancy.

This prospective observational study was carried out on the pregnant females who present to our tertiary care hospital with first trimester vaginal bleeding over a period of 15 months (January 2023- March 2024) and met the inclusion criteria. Total of 133 females were enrolled for the study out of which 31 lost to follow up. Data of 102 females was collected and results were compiled. Elaborate history was taken along with the routine investigations and USG was done to confirm the period of gestation and viability. All these patients were assessed for the primary outcomes including abortions (threatened, complete or incomplete or missed abortions), ectopic pregnancies, molar pregnancies etc.

Patients with threatened abortion who continued with their pregnancy were followed up for maternal and perinatal outcomes.

## 3. Results

Total of 133 females were enrolled for the study out of which 31 lost to follow up. Data of 102 females was collected and results were compiled as follows.

Majority 41(40.20%) of the cases were of 26 -30 years and least number 06(5.88%) of cases of study were present in the age group >35 years as depicted in Table 1. The mean age of the patients of the study was 27.78 years  $\pm$  3.483.

The majority 33(32.35%) cases belonged to lower middle class followed by upper lower class which had 26 (25.49%) cases. Only two (1.96%) cases were from upper socioeconomic status.

72(70.59%) cases were Multigravida out of which 20(19.6%) patients had history of previous abortion, and 30(70.59) were primigravida.

Out of total 102 cases, majority 54(52.94%) cases had gestational age of 7 to 10 weeks at the time of bleeding per vaginum as depicted in Table 1. Mean age = 9.52 $\pm$  2.76 weeks.

Out of total 8 ectopic pregnancy patients that presented with bleeding, 6 of them presented at 7-10 weeks of gestation and 2 presented at <7 weeks of gestation.

In majority 59(57.84%) cases, the bleeding was moderate to heavy while in 43 (42.16%) only spotting was present as shown in Table 2.

Overall patients who presented with spotting, majority of them continued their pregnancy as seen in this study.

Majority of the cases 53(51.96%) were diagnosed with threatened abortion followed by missed abortion in 19

(18.62%) patients. Incomplete abortion in 14 (13.72%) cases incomplete, ectopic pregnancy in 08(7.85%), complete abortion in 04 (3.92%), inevitable abortion in 03(2.51%) and one (0.98%) case of molar pregnancy. These causes of first trimester vaginal bleeding has been summarized in Table 3.

Distribution of cases with first trimester bleeding on the basis of management as depicted in Table 4. Majority 57(55.88%) cases were managed conservatively while in 15 (14.72%) cases medical management was done. In 14 (13.72%) cases Dilatation and evacuation was done and in 08(7.4%) cases Suction and evacuation. Laparotomy was needed in 8(7.84%). Out of total 102 patients 15(14.7%) cases required blood transfusion and ICU stay was needed in 06(5.88%) cases.

Table 5 depicts the distribution of cases on the basis of maternal outcome of threatened abortion. In 26 (49.056%) cases preterm delivery took place while 24 cases (45.28%) delivered at term, out of which 4(7.574%) were IUFD. Other outcomes which overlapped included PPH in 02(3.773%), PIH in 06(11.320%), placenta previa in 11(20.754%), abruptio placenta in 7(13.2%) and PROM 19(35.85%). Second trimester abortion was seen in 3 cases (5.66%).

Majority 35(70%) cases delivered vaginally while in 15 (30%) cases, mode of delivery was C-section.

**Table 1:** Distribution of the cases on the basis of patient characteristics & demography

Parameter	No of cases	%age
<b>1. Age (in years)</b>		
18 -20	08	7.84
21-25	25	24.51
26-30	41	40.20
31-35	22	21.57
>35	06	5.88
Total	102	100
<b>2. Socioeconomic status</b>		
Upper	2	1.96
Upper Middle	24	23.53
Lower Middle	33	32.35
Upper lower	26	25.49
Lower	17	16.67
Total	102	100
<b>3. Parity</b>		
Primigravida	30	29.41
Multigravida	72	70.59
H/o Previous abortion	20	19.61
No h/o previous abortion	52	80.39
Total	102	100
<b>4. Gestational age in weeks at the time of bleeding P/V</b>		
<7	26	25.49
7 -10	54	52.94
10-12	22	21.57
Total	102	100

**Table 2:** Distribution of cases on the basis of amount of bleeding (N=102)

Amount of bleeding	Number	%age
Spotting	43	42.16
Moderate to heavy	59	57.84
Total	102	100

**Table 3:** Distribution of cases according to the various causes of 1<sup>st</sup> trimester vaginal bleeding (N=102)

Cause of bleeding	Number	%age
Threatened abortion	53	51.96
Ultrasonography findings in threatened abortion (N=53)		
Low lying placenta	11	20.75
Sub chorionic haemorrhage	16	30.19
Normal USG	26	49.06
Total	53	100
Complete abortion	04	3.92
Incomplete abortion	14	13.72
Missed abortion	19	18.62
Inevitable abortion	03	2.51
Molar pregnancy	01	0.98
Ectopic pregnancy	08	7.85
Total	102	100

**Table 4:** Distribution of cases on the basis of treatment/management done in first trimester bleeding (N=102)

Management	Number	%age
Conservative	57	55.88
Medical	15	14.72
S & E	08	7.84
D & E	14	13.72
Laparotomy	08	7.84
Total	102	100

**Table 5:** Distribution of cases on the basis of maternal outcome of threatened abortion

Parameter	Number	%age
<b>1. Maternal outcome</b>		
Second Trimester Abortion	03	5.66
Term delivery	24	45.28
Pre-Term delivery	26	49.056
PROM	19	35.85
Abruptio Placenta	07	13.207
Placenta previa	11	20.754
PPH	02	3.773
PIH	06	11.320
<b>2. Mode of delivery</b>		
Vaginal delivery	35	70
Cesarean section	15	30

In the present study neonates with APGAR score < 7 at 1 min were 15(41.31%). Out of total 46 live births, 27(58.69%) case were low birth weight babies and 19(41.31%) required NICU admission. IUFD in 4 cases (7.547%) as depicted in Table 6.

**Table 6:** Distribution of cases on the basis of neonatal outcome

Parameter	Number	%age
APGAR <7 at 1 min	15	32.61
Low birth weight (<2.5 kg)	27	58.69
NICU admission required	19	41.31
IUFD	4	7.54

#### 4. Discussion

During the first trimester, vaginal bleeding emerges as an important concern in obstetrics requiring urgent attention and at times hospital care as IPD. In such pregnancies, maternal and fetal wellbeing is compromised. Therefore it is important to delineate such patients in early pregnancy stages so that they can be managed timely.

In the present study, majority 41 cases (40.20%) fell in age group of 26 -30 years followed by 21 -25 years with 25(24.51%) cases. Least number of cases 06(5.88%) were seen in >35 years of age as seen in Table 1. The mean age of the patients of the study is 27.78 years  $\pm$  3.483. The findings of the study are similar with studies conducted by Arora et al<sup>13</sup> where the majority females (47.3%) of the study were from the age group of 26 to 30 years and Madhurima et al<sup>14</sup> where majority (27.9%) patients belonged to 25 -29 years age group.

In the present study, majority 72(70.59%) cases were Multigravida and 30(29.41%) were primigravida. The findings were similar with the study conducted by Suganya et al<sup>15</sup> which showed 30% primigravida and 70% multigravida. The studies which had different results were Mudhurima et al<sup>14</sup> with 57.5% primigravida and 42.5% multigravida.

In this study, in majority 59(57.84%) cases, the bleeding was moderate to heavy while in 43(42.16%) cases only spotting was present. The findings were similar to the studies conducted by Amirkhani et al<sup>16</sup> where spotting was seen in 3.3% cases while in 96.7% bleeding was moderate to severe and Chandramathi et al<sup>17</sup> where there were only 2% cases of spotting while 80% had moderate and 18% had severe bleeding.

In this study among 72 multigravida patients, previous history of abortion was present in 20 (19.61%) cases. The finding of the present study can be compared with studies conducted by Chandramathi et al<sup>17</sup> where previous history of abortion was present in 16% cases. Study conducted by El Raheem et al<sup>18</sup> showed 45.5% cases had previous history of abortion

From total of 102 cases, majority of the patients 54(52.94%) had gestational age of 7 to 10 weeks at the time of presentation with first trimester bleeding with the mean age  $9.52 \pm 2.76$ . The findings of the study can be compared with studies conducted by Madhurima et al<sup>14</sup> where the 80.3% patients had bleeding in less than 14 weeks while 19.7% had bleeding at more than 14 weeks and El Raheem et al<sup>18</sup> where the mean gestational age of presentation with bleeding was  $13.44 \pm 1.63$  weeks. In another study by Sarmalkar et al<sup>19</sup> where mean gestational age is  $8 \pm 11.9$  weeks.

In the study, most of the cases 53(51.96%) had threatened abortion followed by missed abortion in 19(18.62%) cases, incomplete abortion in 14(13.72%), ectopic pregnancy in 8(7.85%), complete abortion in 04 (3.92%), inevitable abortion in 03(2.51%) and one (0.98%) case of molar pregnancy. Findings of this study can be compared with various studies as in Table 7.

In this study out of the total 53 cases with threatened abortion, majority of the cases 26(49.06%) had normal ultrasonography findings while in 16(30.19%) cases USG showed sub chorionic haemorrhage and in 11 (20.75%) cases there was low lying placenta. The findings can be compared with studies conducted by Sayyad et al<sup>12</sup> where in 7.3% cases there was sub chorionic hematoma. In the study conducted by Agarwal et al<sup>20</sup> observed sub chorionic haemorrhage in 43.55% cases.

In the present study majority 57(55.88%) cases were managed conservatively, 15 (14.72%) cases required medical management, 14 (13.72%) cases required Dilatation and evacuation, 08(7.84%) cases needed Suction and evacuation and 8 (7.84%) cases required laparotomy. 14.7 cases required blood transfusion. The findings of the present study can be compared with studies conducted by Ahmad et al<sup>11</sup> where the conservative treatment was done in 56% cases. In another study, conducted by Sayyad et al<sup>12</sup> 16.15% cases were conservatively managed, 73.8% cases underwent uterine curettage and rest of the cases were managed medically. 2.4% cases required blood transfusion.

The present study observed the maternal outcomes of threatened abortion. In 3 (5.66%) cases second trimester complete abortion was observed. In 26(49.056%) cases preterm delivery took place while in 20(37.74%) cases delivered at term. Other outcomes which overlapped one another included PROM in 19(35.85%) cases, PPH in 02(3.773%), PIH in 06(11.320%) and IUFD in 04(7.574%) cases. Placenta previa was present in 11(20.754%) cases and Abruptio placenta was present in 07(13.207%) cases. The findings of the present study can be compared with studies conducted by Arora et al<sup>13</sup> where it was observed that out of patients who continued pregnancy, 17.3% developed hypertensive disorders such as gestational hypertension, preeclampsia and eclampsia, 21.3% patients had either premature rupture of membranes or pre-term

**Table 7:** Comparison of various studies - cause of 1<sup>st</sup> trimester bleeding

Cause of 1 <sup>st</sup> trimester bleeding	Rani et al (2000) <sup>8</sup>	Harville et al (2003) <sup>9</sup>	Naskar et al (2022) <sup>10</sup>	Ahmad et al (2017) <sup>11</sup>	Sayyad et al (2023) <sup>12</sup>	Present study
Threatened abortion	52%	–	55%	30%	26.5%	51.96%
Complete abortion	-	11%	4.2%	40%	9.9%	3.92%
Incomplete abortion	1%	-	34.1%	-	23.6%	13.72%
Missed abortion	8%	11%	-	-	40%	18.62%
Inevitable abortion	-	-	-	18%	-	2.51%
Molar pregnancy	18%	1%	2.5%	4%	-	0.98%
Ectopic	21%	1%	4.2%	-	-	7.85%

premature rupture of membranes, 12% patients had postpartum haemorrhage. 76.0% patients had one or the other complication in pregnancy. In the study conducted by Bhatti et al<sup>21</sup> preterm delivery took place in 32.25% cases, other maternal outcomes included placenta previa in 8.16%, premature preterm rupture of membranes and antepartum haemorrhage was present in 18.37%. Another study by Kanmaz et al<sup>22</sup> which observed preeclampsia in 3.8%, placenta previa in 0.8% and abruptio placenta was present in 0.4% cases. Karimi et al.<sup>23</sup> conducted a systematic review and meta-analysis to investigate the relationship between first trimester vaginal bleeding and various clinical adverse outcomes. The meta-analysis included 46 relevant studies with sample size of 1,554,141. The presence of vaginal bleeding in the first trimester of pregnancy significantly correlates with an increased risk of adverse pregnancy outcomes, including preterm birth, low birth weight, premature rupture of membranes, miscarriage, stillbirth, placental abruption, and placenta previa.

In the present study, majority 35(70%) cases delivered vaginally while in 15 (30%) cases, mode of delivery was C-section. The findings of the present study are similar to the studies conducted by Madhurima et al<sup>14</sup> where 63.45 delivered vaginally and 36.6% delivered through C section.

In the present study, 27(58.69%) babies out of total 46 cases weighed less than 2.5 kg and 19(41.31%) babies weighed more than equal to 2.5 Kg at the time of birth. The findings of the present study are different from the studies conducted by Chaitanya et al<sup>15</sup> where 77% cases the birth weight was more than 2.5Kg while in 23% cases it was low birth weight and Chandramathi et al<sup>17</sup> where the birth weight of more than 2.5Kg was observed in 73% cases while 27% cases had low birth weight.

In the present study it was observed that 27(58.69%) cases out of total 46 did not require NICU admission. The findings can be compared with the study conducted by Arora et al<sup>13</sup> where 34.7% newborns required NICU admission.

In this study 31(67.39%) babies had APGAR score more than seven at 1 min while 15 (32.61%) had less than seven. The findings can be compared with studies conducted Bhatti et al<sup>21</sup> which observed that an APGAR score at 1 min of <7 was seen in 6.52% of cases while in 35% it was 7. In another study by Madhurima et al<sup>17</sup> where APGAR score less than

7 was observed in 11.2% cases.

## 5. Conclusion

The study indicated that first trimester vaginal bleeding is a prevalent and a concerning occurrence necessitating thorough evaluation to identify the underlying causes like – miscarriage, threatened abortion, ectopic pregnancy, molar pregnancy etc. as such bleeding episodes are linked to suboptimal maternal and fetal outcomes. Notable various complications may ensue in women that continue pregnancy with bleeding in first trimester like- preterm labour, premature rupture of membranes, placenta previa, abruptio placenta, PIH, fetal growth restriction and PPH. As threatened abortion is a precursor to adverse maternal and fetal outcomes thereby emphasizing the importance of ensuring diligent follow up care. Patients with first trimester bleeding should be categorized as high risk patients and be monitored actively during antenatal period with appropriate management strategies in place.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.


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