

## **Pregnancy Outcome in Patients with Threatened Miscarriage and Corelation with Early Sonographic Parameters in a Tertiary Care Hospital of West Bengal**

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### **Abstract**

**Background:** Threatened miscarriage comprises 15–20% of pregnancies. It is one of the commonest gynecological emergencies in early pregnancy. The study examines the pregnancy outcome in patients with threatened abortion and correlation with early sonography parameters.

**Materials & Methods:** An observational study with longitudinal design was conducted for a period of one year. Total 160 pregnant women with a history of vaginal bleeding in their first trimester attending both inpatient and outpatient department who fulfilled the inclusion criterias were included in this study. A Structured Proforma was prepared to collect data and followed till their pregnancy terminated.

**Results:** Out of 160 pregnant women majority (68.1%) were belonging to 21-30 years age group and 11.9% of women were above 30 years. Most of them (65.0%) were primigravida. Majority (38.1%) had vaginal bleeding at gestational age <8 weeks. In most of the individuals (85.0%) gestational sac was implanted at upper segment, only 15% implanted in lower segment. Subchorionic hemorrhage with >4 cm<sup>2</sup> was observed in 11.2% cases. 21.9% had undergone spontaneous abortion and rest continued pregnancy beyond 20 weeks. Among all PROM/PPROM occurred in 9.4% cases, 6.9% study subjects developed hypertension, 6.9% cases had placenta previa and 5.6% cases had placental abruption. Baby of 5% mothers suffered from birth asphyxia, 6.9% suffered from RDS, and 9.4% had Apgar score <5 at 5 minute, 13.1% and 8.1% was preterm baby and IUGR respectively. While baby of 13.1% mothers had to admit in NICU, 1.9% reported as dead in perinatal period.

**Conclusion:** Pregnancies complicated by threatened miscarriage are associated with adverse maternal and perinatal outcome. So proper antenatal care of these mothers and timely intervention prevents both maternal and perinatal complications.

**Keywords:** Threatened miscarriage, vaginal bleeding, subchorionic hemorrhage, pregnancy outcome.

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## Introduction

Vaginal bleeding before 20 weeks of gestation, accompanied by pain abdomen, sometimes without any change of the cervix are clinical features of threatened abortion [1]. It constitutes 15–20% of pregnancies and is one of the common obstetrical emergencies in first trimester. Threatened miscarriage often associated with late pregnancy complications like Premature Rupture of Membrane (PROM)/Preterm prelabor rupture of membrane (PPROM), Low Birth Weight (LBW), abruption of placenta, pre-eclampsia [2,3]. Various studies have reported that there were some early sonographic parameters of predictors of poor outcome such as excessively large, excessively small, or irregularly shaped gestational sac [4], a low implantation site of gestational sac, a large or irregular yolk sac [5], a weak decidual reaction [6], and a slow embryonic heart rate [7]. After first trimester vaginal bleeding if fetal cardiac activity is noted at ultrasound examination there is 95 – 98% chance of such pregnancies will continue beyond 20 weeks of gestation [8]. In symptomatic women sonographic visualization of a subchorionic hematoma is important because pregnant women with such hematoma have a bad prognosis than women without a hematoma. A subchorionic hematoma can be considered large if it is greater than 50% of the size of the gestation sac, medium if it is 20-50% and small if it is less than 20% of the gestation sac. Large hematomas by size (>30- 50%) and volume (>50 mL) worsen the patient's prognosis. The objective of our study was to assess the maternal and perinatal outcome in patients with threatened miscarriage and their correlation with early ultrasound parameters.

## Materials and Methods:

This was an observational type of study with longitudinal design. The study was conducted in the Department of Obstetrics & Gynecology Burdwan Medical College, Burdwan for a period of one year May 2018 to April 2019. The study proposals along with other relevant documents were submitted to the Institutional Ethics Committee of Burdwan Medical College for review and approval. The study was conducted only after approval. Informed written consent was taken from all the study participants. Total 160 pregnant women with a history of vaginal bleeding in their first trimester attending both inpatient and outpatient department of this hospital who fulfilled the inclusion criterias were included in this study. Singleton pregnancy with history of vaginal bleeding in first trimester with closed cervix and documented fetal cardiac activity on ultrasound irrespective of age and parity were included in this study. Multiple pregnancy, molar pregnancy, history of recurrent miscarriage, ectopic pregnancy, diagnosed missed abortion, congenital uterine abnormalities and history of chronic diseases like hypertension, diabetes were excluded from our study. Gestational age was calculated from the date of last menstrual period using modified Naegele's rule and first trimester ultrasonography. Marked discrepancy of one or more weeks led to exclusion of participants from the study. All the participants under study were registered, detailed history was taken also complete physical and obstetrical examinations were performed at the time of first antenatal visit and at the time of admission. They were followed up prospectively at our antenatal clinic and delivered at same hospital. Repeat

ultrasound scans were done by Transvaginal sonography (TVS) and Transabdominal sonography (TAS) when required. In cases of subchorionic hematoma, scans were repeated weekly until resolution of hematoma. The patients were admitted and monitored closely along with supportive therapy with progesterone. Once their symptoms subsided, they were discharged and advised for scheduled antenatal visits in our antenatal clinic. Selected patients were subjected to first TVS examination using USG Machine (Philips HD7) with transvaginal probe of frequency 5-7.5 MHz in their first trimester at the time of first visit. Early scan by TVS included location and size of gestational sac also its irregularity, subchorionic hematoma, implantation of placenta and decidual reaction. Follow up scan done by transabdominal sonography using a low-frequency probe (3/3.5 MHz) with real-time sector scanner at 20 weeks to rule out fetal structural abnormality, and again at 28, 34 and 38 weeks and when necessary to look for fetal growth, amniotic fluid index, placenta previa or abruption. Both TVS and TAS were done and reviewed by a single radiologist experienced in obstetric sonography to reduce the observational bias.

The main outcome of interest in our study was to find out proportion of study subjects who underwent spontaneous abortion and continue pregnancy in form of preterm as well as term delivery. In addition, proportion of certain maternal and neonatal complications was also assessed. The maternal outcome included spontaneous miscarriage, PROM/PPROM, hypertensive disorders of pregnancy (HDP) and antepartum hemorrhage

(placenta previa/ placental abruption). The perinatal outcome included birth asphyxia, RDS (Respiratory distress syndrome), low birth weight, Apgar score at 1 and 5 minutes of birth, perinatal mortality and NICU admission.

#### Statistical Analysis:

Collected data were checked for completeness and consistency. Then the data were entered on Excel data sheets (Microsoft Excel, 2013). The principles of descriptive statistics were applied to organize and present the data in tables and figure. Proportions in relation to different outcome variables were also calculated. Data were analyzed using Statistical Package for Social Sciences Statistical Package for the Social Sciences (SPSS) [IBM SPSS Statistics for Windows, Version 20.0. (IBM Corp., Armonk, New York, USA)]. Chi-square test was applied as and when applicable basis considering p value <0.05 as statistically significant.

#### Results:

This prospective observational analysis was performed for maternal and perinatal outcome in patients with threatened miscarriage and their correlation with early ultrasonography markers. Total 160 pregnant women with history vaginal bleeding in first trimester were evaluated.

In present study majority (68.1%) were belonging to 21-30 years age group and 11.9% of women were above 30 years. Most of them (65.0%) were primigravida. Majority of them (38.1%) had vaginal bleeding at gestational age <8 weeks followed by gestational age of 8-10 weeks (34.4%) [Table 1].

**Table 1: Characteristics of study subjects (n=160)**

Characteristics	Frequency	Percent (%)
<b>Age (years):</b>		
≤ 20	32	20.0
21-30	109	68.1
> 30	19	11.9

<b>Gravida:</b>		
1 <sup>st</sup> (Primi)	104	65.0
2 <sup>nd</sup>	32	20.0
3 <sup>rd</sup>	24	15.0
<b>Gestational age at which bleeding occurred:</b>		
<8 weeks	61	38.1
8-10 weeks	55	34.4
10-12 weeks	44	27.5
Total	160	100.0

As per our observation on TVS, gestation sac was implanted in most of the individuals (85.0%) at upper segment, only 15% implanted in lower segment. Subchorionic hemorrhage with  $>4 \text{ cm}^2$  was observed among 18 (11.2%) individuals. Among study subjects with subchorionic hemorrhage  $>4 \text{ cm}^2$ , majority [12(66.7%)] were aborted. Again, among study subjects

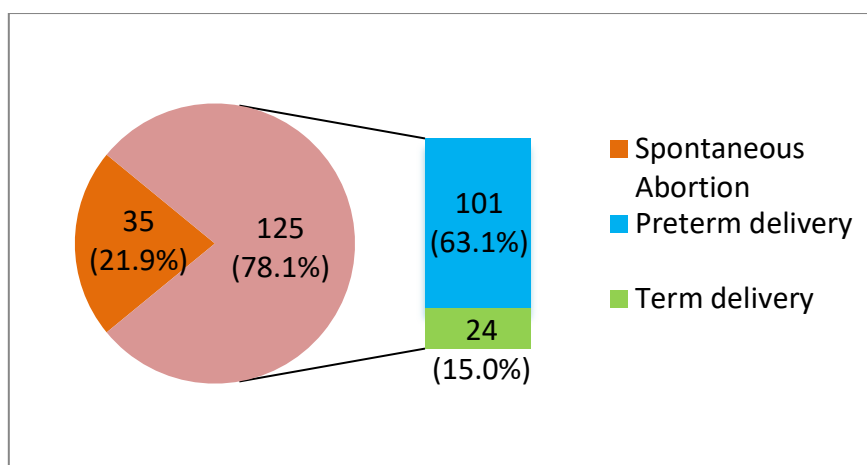
with subchorionic hemorrhage  $\leq 4 \text{ cm}^2$ , four-fifth individuals [24(80%)] continued pregnancy. Among overall study subjects 86.9% individuals had placenta in upper segment of uterus; 10% had weak decidual reaction. Only few of them(3.1%) had small or irregular gestational sac out of which 100% aborted before 12 weeks [Table: 2].

**Table 2: Distribution of study subjects according to TVS parameter (n=160)**

TVS parameters	Frequency	Percent
<b>Implantation of Gestational sac:</b>		
Upper segment	136	85.0
Lower segment	24	15.0
<b>Subchorionic hemorrhage (<math>\text{cm}^2</math>):</b>		
$>4$	18	11.2
$\leq 4$	30	18.8
No hemorrhage	112	70.0
<b>Placental position:</b>		
Upper segment	139	86.9
Lower segment/Low lying	21	13.1
<b>Decidual reaction</b>		
Weak/Poor	16	10.0
Well developed	144	90.0
<b>Gestational sac:</b>		
Small or irregular	5	3.1
Regular	155	96.9
Total	160	100.0

About one-fifth of the study subjects (21.9%) had undergone spontaneous abortion and rest continued pregnancy beyond 20 weeks. [Figure 1]

Further analysis showed that among spontaneous abortion cases, the abortion happened within 12 weeks and between 12-20 weeks respectively among 24 (68.6%) and 11 (31.4%) individuals.



**Figure 1: Distribution of study subjects according to outcome of pregnancy (n=160)**

In present study, among primigravida mothers majority (88.5%) delivered baby uneventfully; and statistically significant association between gravida and pregnancy outcome was noted. Similarly, outcome of pregnancy was noted significantly associated (<0.001) with

gestational age at which bleeding occurred, nature of gestational sac, decidual reaction, placenta position, subchorionic hemorrhage and implantation of gestational sac; but not with age of mother (0.490).

**Table 3: Relationship between maternal characteristics and outcome of pregnancy**

Characteristics	Spontaneous abortion	Successful delivery	p-value
<b>Age (years):</b>			
≤ 20	7 (21.9)	25 (78.1)	0.490
>20	28 (21.9)	100 (78.1)	
<b>Gravida:</b>			
1 <sup>st</sup> (Primi)	12 (11.5)	92 (88.5)	<0.001
Others	23 (41.1)	33 (58.9)	
<b>Gestational age at which bleeding occurred:</b>			
<8 weeks	24 (39.3)	37 (60.7)	<0.001
≥8 weeks	11(11.1)	88 (88.9)	
<b>Gestational sac:</b>			
Small and or irregular	5 (100.0)	0 (0.0)	<0.001*
Regular	30 (19.4)	125 (80.6)	
<b>Decidual reaction:</b>			
Weak/Poor	14 (87.5)	2 (12.5)	<0.001
Well developed	21 (14.6)	123 (85.4)	
<b>Placenta position:</b>			
Upper segment	24 (17.3)	115 (82.7)	<0.001
Lower segment	11 (52.4)	10 (47.6)	
<b>Subchorionic or peri-gestational hemorrhage:</b>			
> 4 cm <sup>2</sup>	12 (66.7)	6 (33.3)	<0.001
Others	23 (16.2)	119 (83.8)	
<b>Implantation of gestational sac:</b>			
Upper segment	22 (16.2)	114 (83.8)	<0.001
Lower segment	13 (54.2)	11 (45.8)	

Note: \* Fisher's exact test

Among overall study subjects PROM/PPROM occurred in 15 (9.4%) patients. Again, 11 (6.9%) study subjects developed hypertension; 11(6.9%) and 9 (5.6%) individuals had placenta previa and placental abruption respectively [Table 4]. Remarkably, baby of 5% of overall mothers suffered from birth asphyxia,

6.9% suffered from RDS, and 9.4% had Apgar Score <5 at 5 minute, 13.1% and 8.1% was preterm baby and IUGR respectively. While baby of 13.1% mothers had to admit in NICU, 1.9% reported as dead in perinatal period. [Table 4]

**Table 4: Distribution of study subjects in relation to certain maternal and neonatal outcome**

Characteristics	Frequency	Percent
<b>Maternal Outcome</b>		
PROM / PPROM	15	9.4
Hypertension	11	6.9
Placenta Previa	11	6.9
Placental Abruption	9	5.6
<b>Neonatal Outcome</b>		
Birth Asphyxia	8	5.0
Respiratory Distress Syndrome (RDS)	11	6.9
Apgar Score <5 at 5 minute	15	9.4
Preterm Birth	21	13.1
Intra-uterine Growth Retardation (IUGR)	13	8.1
NICU Admission	21	13.1
Perinatal Mortality	3	1.9

### Discussion:

The pregnancy outcome of first trimester vaginal bleeding is uncertain. It is associated with an increased miscarriage rate and pregnancy complications. The present study was conducted with an aim to find out effect of threatened miscarriage in the current pregnancy on the subsequent maternal and perinatal outcome.

Majority of women in our study were belonging to 21-30 years age group (68.1%), 11.9% of women were more than 30 years of age [Table 1], but pregnancy complications were seen more among them. In their study Bennett et al [9] reported spontaneous abortion rate was approximately twice as high for women aged 35 year or older as compared to younger women (13.8% and 7.3%) respectively. Most of mothers (65.0%) were primigravida and 38.1% had vaginal

bleeding at gestational age before 8 weeks followed by 34.4% at gestational age between 8-10 weeks [Table 1]. The results of our study were comparable to the study done by Bharadwaj et al [10] where bleeding occurred in 35% cases between 8 –10 weeks and 22% cases between 11 -12 weeks. In our study on TVS gestational sac was implanted in most of the individuals (85.0%) at upper segment. Only 15% implanted in lower segment out of which 35% aborted. In their study Elson et al [11] reported that there was an increased incidence of abortion with low implantation of sac. Presence of subchorionic hematoma and its amount has an impact on progress of ongoing pregnancy. In our study 30% of patients had subchorionic hemorrhage. 11.2% had hematoma >4 cm<sup>2</sup> of which 66.7% cases aborted and 33.3% continued pregnancy beyond 20 weeks. 18.8% patients had

subchorionic hematoma  $< 4 \text{ cm}^2$  of which 80% continued pregnancy, 20% aborted [Table 2]. In their study Nagy et al<sup>12</sup> reported retroplacental hematoma was significantly correlated with an increased risk for adverse maternal and neonatal complications. The presence or absence of symptoms of threatened abortion did not affect these outcomes. They also showed the rates of pregnancy-induced hypertension and preeclampsia was significantly greater in the hematoma group. A low lying placenta on USG at the time of initial screening before 20 weeks was seen in 13.1% of women [Table 2], but when the incidence was compared at 36 weeks only 6.9% presented as placenta previa [Table 4]. The findings of our study almost correlated with studies done by Weiss et al [13] and Daveri-Tanha et al [14]. The location of the chorionic frondosum inside uterus in early pregnancy may explain this association, with low lying placenta more likely to cause first trimester bleeding, as well as a higher risk of placenta previa in late pregnancy. Placental hemorrhage may recur later in pregnancy, which result in placental abruption. In our study, the incidence of placental abruption was 5.6% [Table 4]. Daveri –Tanha et al also reported incidence of placental abruption was 5.7%. Various sonographic parameters of predictors of poor outcome in pregnancy have been described by various authors, including an excessively small or irregular shape gestational sac, low implantation site, a weak decidual reaction. In our study only 10% had poor decidual reaction [Table 2] of which 87.5% had miscarriage. Small sac was seen 3.1% cases [Table 2] of which 100% aborted before 12 weeks. In their study Bromley et al [15] showed 15 of the 16 patients with first trimester small sacs had spontaneous miscarriage despite normal sonographic cardiac activity. In our study spontaneous abortion rate for the patients after a viable pregnancy diagnosed on sonography was 21.9%. In their study

Agarwal et al [16] found an incidence of spontaneous abortion 21% in 62 patients with a history of threatened abortion in first twenty weeks of pregnancy. In our study, PROM & PPROM was found in 9.4% cases, while study done by Davari-Tanha et al 16% of patients had PPROM. An association between threatened miscarriage and PPROM was also shown by other study Farrell T et al [17]. There was increased incidence of preeclampsia among mothers with first trimester vaginal bleeding as reported by Verma et al [18]. Our study reported hypertension in 6.9% cases. In our study baby of 5% of overall mothers suffered from birth asphyxia, 6.9% suffered from RDS, 9.4% had Apgar Score  $< 5$  at 5 minute, 13.1% and 8.1% was preterm baby and IUGR respectively. While baby of 13.1% mothers had to admit in NICU, 1.9% reported as dead in perinatal period [Table 4]. In their study Samalkar MS et al [19] reported among 92 neonates incidence of birth asphyxia and RDS were 5.4% and 13.0% respectively. Apgar score  $< 5$  at 5 min was seen in 9.95% of babies in their study. There were varying reports as regards intrauterine growth restriction is concerned among various groups. In their study Arafa et al [20] reported an incidence of IUGR was 48.5% whereas study done by Daveri-Tanha et al reported incidence was 2%. In their study Agrawal et al reported perinatal loss was 8.16% of cases. In their study 13.1% of babies required NICU admission out of which 19 recovered and 6 died within 7 days. Bimsara et al [21] showed incidence of NICU admission was 19.1% among 110 study cases in their study. [22]

### Conclusion:

Early pregnancy sonography parameters are very useful for prediction of outcome in women with threatened miscarriage. Incidences of maternal and fetal complications are increased in cases with threatened miscarriage those who have completed their pregnancy. [23] Therefore these pregnancies should be considered as

high risk and adequate antenatal care should be taken to prevent maternal and perinatal complications.

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