

Original research article**An evaluation of pregnancy outcome with first trimester bleeding per vaginum**¹Salicheemala Bhuvanewari, ²Sandhya Bhukya, ³Vankeepuram Vishnukalyani^{1,2,3}Assistant Professor, Department of Obstetrics and Gynaecology, Srivenkateswara Medical College, Tirupati, Andhra Pradesh, India**Corresponding Author:**
Salicheemala Bhuvanewari**Abstract**

Background & Objectives: Bleeding per vaginum in the first trimester occurs in 15-25 % of all pregnancies with 50% pregnancy loss. The significance of bleeding in early pregnancy may vary in presentation from simple implantation bleeding to life threatening emergency like ectopic or molar pregnancy. This bleeding might be associated with subchorionic hemorrhage or hematoma which in turn will effect the maternal and perinatal outcome. To identify the cause of vaginal bleeding in first trimester and to evaluate the maternal and perinatal outcome of first trimester bleeding per vaginum; To discuss the role of ultrasound in pregnancy outcome of first trimester bleeding per vaginum.

Methods: This is a Prospective observational study which included obstetric cases with history of bleeding per vaginum in first trimester of pregnancy, who give informed consent for the study during the period of May 2022 to March 2023, who were selected by systematic randomization method. A detailed history was taken, clinical examination including complete general physical examination and local examination was done to arrive at a provisional clinical diagnosis which followed by an ultrasound examination. Maternal and perinatal outcome was then assessed in terms of the maternal and perinatal outcome.

Results: In 95 cases of first trimester bleeding, there were 16 first trimester miscarriage, 4 second trimester miscarriage and 75 pregnancies proceeded to the period of viability. Preterm births were 13, full term were 62. Out of all, 6 underwent caesarean section and 56 patients delivered vaginally, 3 instrumental deliveries and 1 breech extraction. Total of 1 perinatal mortality due to birth asphyxia.

Conclusion: To conclude that early diagnosis, bed rest and regular antenatal follow-up will help in continuing the pregnancy till term with good maternal and fetal outcome. Ultrasound being a sensitive, cost effective and most important non-invasive diagnostic tool, helped in confirming the clinical diagnosis and instituting appropriate treatment.

Keywords: SCH, Ultrasound, first trimester bleeding

Introduction

Vaginal bleeding in the first trimester of pregnancy is a common obstetric problem and causes worry and anxiety both to the patient and the obstetrician. First trimester is a dynamic period which spans ovulation, fertilization, implantation and organogenesis. 20-25% of pregnant women will have bleeding of some degree during early months of gestation ^[1]. Also, it is estimated that more than 90% of threatened abortion occurs in the first trimester and that most abortions in early first trimesters are due to chromosomal anomalies. The significance of bleeding in early pregnancy in a given patient may vary in presentation from simple implantation bleeding to life threatening emergency like ectopic or molar pregnancy ^[2]. Bleeding can originate from the uterus, cervix, vagina or it can be extra-genital. It may be the initiation of spontaneous miscarriage or may be the sign of a pathological condition such as ectopic pregnancy or gestational trophoblastic disease ^[3-5].

The three major causes of bleeding in first trimester are abortion, ectopic pregnancy and molar pregnancy and causes unrelated to pregnancy like cervical erosion, polyp, vaginal varicose or cervical carcinoma. Also it is estimated that more than 90% of threatened abortion occurs in the first trimester and that most abortions in early first trimesters are due to chromosomal anomalies. First-trimester vaginal bleeding has been associated with pregnancy outcome such as threatened abortion, incomplete abortion, complete abortion, missed abortion, blighted ovum, inevitable abortion and in later half of pregnancy it can be associated with pre-eclampsia, eclampsia, gestational hypertension, antepartum hemorrhage (APH, Placenta Previa, abruption, other causes of APH), PPRM/PROM, term delivery, mode of delivery (Instrumental and Caesarean Deliveries), Postpartum Hemorrhage (PPH) and Retained Placenta. The perinatal outcomes included preterm delivery, low birth weight, IUGR and IUFD ^[4].

Ultrasound plays a role of utmost importance in confirming the pregnancy, site of pregnancy, viability

and also in predicting whether a pregnancy has a good chance of continuing or it is destined to fail or has already failed. It is hypothesized that subchorionic hematoma noted in an USG signifies an underlying placental dysfunction that subsequently results in pregnancy complications including abruption, preterm premature rupture of membranes, preterm delivery, pre-eclampsia and fetal growth restriction.

In some cases, subchorionic hematoma may be present but will not be seen on USG because the blood drains into vaginal canal rather than collecting in subchorionic space around gestational sac, conversely there may be no bleeding associated with a subchorionic hematoma that can be seen on USG because it is not draining into vaginal canal. Worst pregnancy outcome is associated with large hematoma or severe bleeding compared with the outcome in patient with small hematoma or less bleeding. This study aims to identify the course, pattern and complications of pregnancies with bleeding for the first time before 12 weeks of gestation so that early diagnosis and necessary treatment can be instituted.

Aim & Objectives

Aim

The purpose of this prospective observational study is:

- To identify the cause of vaginal bleeding in first trimester and to evaluate the maternal and perinatal outcome of first trimester bleeding per vaginam.

Objectives

- To discuss the role of ultrasound in pregnancy outcome of first trimester bleeding per vaginam.

Materials and Methods

The main source of data for this study were antenatal mothers visiting the Obstetrics and Gynaecology department of Government Maternity Hospital, Tirupati.

Inclusion Criteria

- All the Pregnant women with viable singleton pregnancy with bleeding per vaginam less than 12 weeks of gestation calculated by last menstrual period or by previous ultrasound study.

Exclusion Criteria

- Pregnant women more than 12 weeks of gestation,
- Twin pregnancies,
- APLA positive pregnant patients and
- Pregnant women with thrombophilias and other bleeding disorders,
- Patients with medical disorders e.g. hypothyroidism, diabetes mellitus, chronic hypertension
- Other local causes of bleeding from the cervix and vagina and uterine anomalies.

Methods of collection of data

Patients visiting Government Maternity Hospital, Department of Obstetrics and Gynaecology between May 2022 to March 2023, who gave informed consent for the study. A detailed history was taken for the patients who meet the inclusion criteria and were followed up. General and Obstetrics examination was done including relevant investigations necessary for follow up. Maternal and perinatal outcome were assessed in terms of first trimester miscarriage, second trimester miscarriage, preterm labour, full term labour, mode of delivery, weight of the baby, maturity and APGAR scoring.

Sample size: Total of 95 cases to be studied and followed up.

Type of study: It will be a prospective observational study.

Sampling method: Systematic Randomization.

Statistical Analysis: SPSS version 21 was used for analyzing the data. Continuous variables expressed as Mean \pm SD. Categorical variables expressed as frequency and percentages.

Results

A prospective observational study was undertaken on maternal and perinatal outcome in women with viable singleton pregnancy with bleeding per vaginam less than 12 weeks of gestation from the period of May 2022 to March 2023, visiting the Obstetrics and Gynaecology department of Government Maternity Hospital Tirupati.

Patient characteristics: Patients were distributed according to their gestational age, parity, volume of bleeding, presence of sub-chorionic hemorrhage during an emergency ultrasound and perinatal outcome.

Antenatal visits: Details regarding the number of antenatal visits, type of antenatal care received by each group was recorded.

Statistical analysis: SPSS version 21 was used for analyzing the data. Continuous variables expressed as Mean \pm SD. Categorical variables expressed as frequency and percentages.

Table 1: Distribution of Patient According to Parity

Parity	Frequency	Percent
I	56	58.9
II	34	35.8
III	5	5.3
Total	95	100.0

In this study there were a total of 95 cases which were studied out of which 56 patients were primigravida which is 58.9%, 34 patients were second gravida which is 35.8% and a total of 5 patients were third gravida which is 5.3%. So, first trimester bleeding is more common in primigravida.

Table 2: Age Distribution

Age Group (in years)	Frequency	Percent
≤ 20	14	14.7
21-25	35	36.8
26-30	40	42.1
> 30	6	6.3
Total	95	100.0

In this study there were 14.7% in the age group of ≤ 20 years, 36.8% in the age group of 21-25 years, 42.1% belonged to the age group of 26-30 years and 6.3% who were > 30 years of age. So, bleeding in first trimester was more common in age group of 26-30 years.

Table 3: Distribution of Socio-Economic Status

Socio-economic status	Frequency	Percent
Upper	5	5.2
Upper Middle	36	37.8
Lower Middle	38	40
Upper Lower	8	8.4
Lower	8	8.4
Total	95	100

In this study, there were 5.2% cases who belonged to upper class of socio-economic status, 37.8% cases belonged to upper middle class, 40% cases belonged to the lower middle class, 8.4% cases belonged to upper lower class and 8.4% cases belonged to lower class of socio-economic status.

Table 4: Distribution of Gestational Age at the Time of Bleeding

Gestational age	Frequency	Percent
≤ 8 weeks	40	42.1
> 8 weeks	55	57.9
Total	95	100.0

In this study, there were 40 patients who were ≤ 8 weeks at the time of bleeding which is 42.1% and 55 patients were > 8 weeks at the time of bleeding which is 57.9%. So, bleeding is more common after 8 weeks.

Table 5: Distribution According to Presence of SCH on USG

USG	Frequency	Percent
Normal	72	75.8
SCH (sub chorionic haemorrhage)	23	24.2
Total	95	100.0

In my study, 23 patients had USG evidence of SCH which is 24.2% while for 72 patients which is 75.8% there was no evidence of sub-chorionic hemorrhage on scan.

Table 6: Distribution According to Causes of Bleeding

Causes	Frequency	Percentage
Threatened abortion	75	78.9
Incomplete abortion	7	7.3
Complete abortion	8	8.4
Missed abortion	5	5.2
Total	95	100

In this study, a total of 78.9% cases had threatened abortion, 7.3% cases had incomplete abortion, 8.4% cases had complete abortion and 5.2% cases had missed abortion. It was found that threatened abortion was the most common cause for bleeding during first trimester.

Table 7: Distribution of Patient According to Volume of SCH

Volume of Sub chorionic Haemorrhage (SCH)	Total	Abortion	Viable Gestation
< 1 ml	7 (30.4%)	1 (14.2%)	6 (85.7%)
1-10 ml	6 (26.1%)	2 (33.3%)	4 (66.6%)
>10 ml	10 (43.5%)	8 (80.0%)	2 (20.0%)

In this study, out of 23 patients with evidence of SCH on USG, 7 patients had <1 ml SCH volume, 6 patients had 1-10 ml SCH volume and 10 patients had SCH volume of >10 ml which are 30.4%, 26.1% and 43.5% respectively.

Patients with SCH <1ml, 1 (14.2 %) case had an abortion while 6 (85.7 %) cases had a viable gestation. 2 (33.3%) patients aborted when the SCH volume was 1-10 ml while 4 (66.6%) patients had a viable gestation.

It was noted that 8 (80.0%) patients had an abortion when the SCH volume was >10 ml while 2 (20.0%) were viable gestations.

Table 8: Distribution According to Outcome of Pregnancy

First		
Trimester abortion (A ¹)	16	16.8
Second trimester abortion (A ²)	4	4.2
Preterm	13	13.7
Full Term	62	65.3
Total	95	100.0

In this study of 95 cases, there were 16 first trimester miscarriages which is 16.8%, 4 second trimester miscarriages which is 4.2%, 13 preterm births which is 13.7% and a total of 62 full term births which amounts to 65.5%.

Table 9: Distribution According to Outcome of Pregnancy in Relation to Subchorionic Hemorrhage

		OUTCOME			
		First trimester abortion (A ¹)	Second trimester abortion (A ²)	Preterm	Full Term
<1 ml	Count	1	0	1	5
	% within Volume	14.3%	0.0%	14.3%	71.4%
U	Count	1	1	1	3
	% within Volume	16.7%	16.7%	16.7%	50.0%
M1-10 ml	Count	6	2	1	1
	% within Volume	60.0%	20.0%	10.0%	10.0%
S	Count	8	3	3	9
	% within Volume	34.8%	13.0%	13.0%	39.1%
>10 ml	Total				

12 cells (100.0%) have expected count less than 5. The minimum expected count is 0.78.

Among the 23 cases with SCH on USG, when SCH was <1 ml, there were 1 (14.3%) first trimester abortions, 1 (14.3%) preterm birth and 5 (71.4%) full term births.

Within the group of patients with 1-10 ml SCH volume, 1 (16.7%) first trimester abortions, 1 (16.7%) second trimester abortion, 1(16.7%) preterm birth and 3 (50.0%) full term births.

When the SCH volume was >10 ml, it was noted that there were 6 (60.0%) patients had first trimester abortion, 2 (20.0%) second trimester abortions, 1 (10.0%) preterm birth and 1 (10.0%) full term births. As a whole among 23 patients with SCH, there were a total of 8 (34.8%) first trimester abortions, 3 (13.0%) second trimester abortions, 3 (13.0%) preterm births and 9 (39.1%) cases had full term births. It was noted that, as the volume of the subchorionic hemorrhage increased it had a worse prognosis on the outcome of the pregnancy and the amount of volume of subchorionic hemorrhage directly affected the outcome of the pregnancy.

Table 10: Distribution according to mode of delivery

Mode of Delivery	Frequency	Percent
FTND (full term normal delivery)	52	69.3
PTD (Preterm vaginal delivery)	13	17.3
LSCS (Lower segment caesarean section)	6	8.0
Instrumental Delivery	3	4.0
BEX (Breech extraction)	1	1.3
Total	75	100.0

In this study, out of a total of 75 viable gestations, 52 patients had a full term vaginal delivery which is 69.3%, 13 patients had a preterm vaginal delivery which is 17.3%, 6 lower segment caesarean sections which is 8.0%, 3 forceps deliveries which is 4.0% and 1 breech extraction which is 1.3%.

Table 11: Distribution of birth weight

Birth Weight (kg)	Frequency	Percent
≤ 1.5	4	5.3
1.6-2	12	16.0
2.1-2.5	21	28.0
2.6-3	31	41.3
> 3	7	9.3
Total	75	100.0

In my study, 5.3% babies had birth weight of ≤ 1.5 kg, 16.0% were born with birth weight of 1.6-2 kg, 28.0% were born with birth weight 2.1-2.5 kg, 41.3% babies were born with birth weight between 2.6-3 kg and 9.3% had birth weight >3 kg.

Table 12: Distribution of APGAR at 1 minute

APGAR 1Min	Frequency	Percent
< 5	5	6.7
5-8	68	90.7
> 8	2	2.7
Total	75	100.0

In this study, 90.7% babies had APGAR 5-8 at 1 minute. APGAR at 1 minute was dependent on various factors like MAS, BA, prematurity, neonatal jaundice.

Table 13: Distribution of APGAR at 5 minutes

APGAR 5 Mins	Frequency	Percent
< 7	7	9.3
7-9	66	88.0
> 9	2	2.7
Total	75	100.0

In this study, 88% babies had APGAR of 7-9 at 5 minutes. APGAR of the babies was dependent on various factors like MAS, prematurity, neonatal jaundice, birth asphyxia.

Table 14: Distribution of Perinatal Mortality

	Frequency	Percent
Normal	74	98.7
Perinatal Mortality	1	1.3
Total	75	100.0

In this study there was 1 perinatal mortality due to birth asphyxia and prematurity which is 1.3%.

Table 15: Distribution of Perinatal Morbidity

	Frequency	Percent
Normal	74	77.9
MAS (Meconium aspiration syndrome)	3	3.2
NJ (Neonatal jaundice)	5	5.3
PREM (Prematurity)	13	13.7
Total	95	100.0

Perinatal morbidity depends on various factors like MAS, neonatal jaundice, prematurity, birth asphyxia. In this study, morbidity due to MAS was 3 which is 3.2%, due to NJ was 5 which is 5.3%, prematurity was noted in 13 newborns which is 13.7%.

Discussion

Although first trimester bleeding per vaginum is commonly considered as a marker of pregnancy at risk for adverse outcomes, few studies have vigorously investigated the prevalence and predictors of bleeding. First trimester bleeding per vaginum occurs in 15-25% of all pregnancies and subchorionic hematoma is a common finding at ultrasound scanning in the early stages of pregnancies. Pre-existing medical conditions, autoimmune diseases and immunological factors have been associated with intrauterine hematoma but the etiology of this condition is still unknown. SCH is defined as a collection of blood between the uterine wall and chorionic membrane and it is believed to result from subchorionic bleeding caused by partial detachment of trophoblast from the uterine wall, this condition was diagnosed only by USG [6,7].

In this study out of a total of 95 cases who presented with first trimester bleeding per vaginum, 56 patients (58.9%) were primigravida, 34 patients (35.8%) were second gravida and 5 patients (5.3%) were third gravida. It was noted that bleeding in the first trimester is more common in primigravida.

Calleja-Agius [2]. Conducted a study on subchorionic hemorrhage in first-trimester pregnancies, prediction of pregnancy outcome with sonography and found that the overall spontaneous abortion rate was 9.3% (48 of 516 patients). The rate nearly doubled when the separation was large (18.8%) compared with small and moderate hematomas (7.7% and 9.2%, respectively). A large separation was found to be associated with an almost three-fold increase in risk of spontaneous abortion. The spontaneous abortion rate was approximately twice as high for women aged 35 years or older versus younger women (13.8% and 7.3%, respectively) and for women with bleeding at 8 weeks gestation or less compared with those with bleeding at greater than 8 weeks gestation (13.7% versus 5.9%). In this study out of 95 cases studied the prevalence of bleeding was 14.7% for patients \leq 20 years, among age group 21-25 years it was 36.8%, 26-30 years it was 42.1% and 30 years it was 6.3%. Hence, the prevalence of bleeding is more common in 26-30 years age group. But in this study there was no significant change in relation to age group.

In this study, a total of 75 (78.9%) cases had threatened abortion, 7 (7.3%) cases had incomplete abortion, 8 (8.4%) cases had complete abortion and 5 (5.2%) cases had missed abortion. It was found that threatened abortion was the most common cause for bleeding during first trimester.

In this study, out of the total 75 viable pregnancies, mode of delivery was dependent both on fetal and maternal condition. Depending on which 13 patients delivered preterm babies, full term vaginal delivery in 52 cases, 6 patients had lower segment caesarean section, 3 patients had instrumental delivery and 1 patient had a breech extraction i.e. 8% Caesarean section, 17.3% had preterm vaginal birth, 69.3% full term vaginal birth, 4% instrumental delivery and 1.3% breech extraction.

Meenal S. Sarmalkar *et al.* [8] conducted a retrospective-prospective observational study on maternal and perinatal outcome in women with threatened abortion in first trimester. The study was done on 100 pregnant women with a history of threatened abortion in the first trimester. Out of 100 patients, preterm births and LBW babies were found in 21% and 13% of patients respectively. In this study the perinatal mortality count in the 75 cases who continue till period of viability, was 1 (1.3%). The perinatal outcomes were affected by various factors like birth asphyxia, meconium aspiration syndrome and prematurity. Weight of the baby did not show any relation with the amount of SCH. Amongst those 75 outcome 31 (41.3%) cases showed baby weight from 2.6 – 3 kg. Thus showing no significance with the vaginal bleeding. APGAR of the babies depend on various factors like prematurity, birth asphyxia, MAS. One of major aims of proper management of patients with first trimester bleeding is to minimize the maternal morbidity and mortality.

Conclusion

In the present study, bleeding in first trimester was more common in primigravida. It was more in the age group of 26-30 years. Bleeding was more common in between 9-12 weeks of gestation. There is no effect on perinatal outcome when the patient reached term. Most of the cases had come with bleeding in the more than 8 weeks period of gestation and the most common cause was found to be threatened abortion. Maternal outcome and mode of delivery for those who crossed the period of viability were, 13 patients

delivered preterm babies, 6 patients had lower segment caesarean section, 3 patients had instrumental delivery, 1 patient had a breech extraction and the rest 52 cases had full term vaginal delivery. According to this study the outcome of the fetus is not influenced by bleeding in the first trimester.

Ultrasound being a sensitive, cost effective and most important non-invasive diagnostic tool, helped in confirming the clinical diagnosis and instituting appropriate treatment. The most important factor which affect the outcome is gestational age at which SCH was diagnosed and volume of hematoma. Therefore, we can say there is no significance of SCH affecting the maternal outcome. The limitation of this study is that frequency, amount and severity of bleeding was not determined as per the standard protocols.

Funding Support: Nil.

Conflict of interest: None.

References

1. Wittels KA, Pelletier AJ, Brown DF, Camargo CA. Jr United States emergency department visits for vaginal bleeding during early pregnancy, 1993-2003. *Am J Obstet Gynecol.* 2008;198:523.e1-6.
2. Calleja-Agius J. Vaginal bleeding in the first trimester. *Br J Midwifery.* 2008;16:656-61.
3. Poulouse T, Richardson R, Ewings P, Fox R. Probability of early pregnancy loss in women with vaginal bleeding and a singleton live fetus at ultrasound scan. *J Obstet Gynecol.* 2006;26:782-4.
4. Schauberger CW, Mathiason MA, Rooney BL. Ultrasound assessment of first-trimester bleeding. *Obstet Gynecol.* 2005;105:333-8.
5. Fleischer AC, Andreotti RF, Bohm-Velez M, Fishman EK, Horrow MM, Hricak H. American College of Radiology (ACR) Appropriateness Criteria; First trimester bleeding; c2007. p. 5. Available from: www.acr.org.
6. Luise C, Jermy K, May C, Costello G, Collins WP, Bourne TH. Outcome of expectant management of spontaneous first trimester miscarriage: Observational study. *BMJ.* 2002;324:873-5.
7. Sotiriadis A, Makrydimas G, Papatheodorou S, Ioannidis JP. Expectant, medical or surgical management of first-trimester miscarriage: A meta-analysis. *Obstet Gynecol.* 2005;105:1104-13.
8. Meenal S Sarmalkar, Shashibala Singh, Arun H Nayak. Maternal and perinatal outcome in women with threatened abortion in first trimester *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2016;5(5):1438-1445.