# Ultrasonogram as a diagnostic tool in evaluation of first trimester bleeding and its correlation with pregnancy outcome

[1]Dr. Gujju Sandheepini, Final year Post Graduate, Department of Obstetrics and Gynaecology, Katuri Medical College and Hospital, Guntur

[2]Dr. Vasavi Mounika Sampathi, Senior resident, Guntur Medical College, Guntur

[3]Dr. Tadepalli Harika, MS OBG SR Katuri Medical College, Guntur

[4]Dr. Radhika Kodali, Associate Professor, Katuri Medical College and Hospital, Guntur

**Corresponding Authors:** Dr. Gujju Sandheepini, Final year Post Graduate, Department of Obstetrics and Gynaecology, Katuri Medical College and Hospital, Guntur

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**Abstract**

Bleeding at first trimester is an independent risk factor for the outcome of the pregnancy, and it is proportional to the amount of bleeding. It can be a natural symptom of implantation, signs of spontaneous abortion or a pathological condition like ectopic pregnancy /gestational trophoblastic disease. Heavy bleeding may impede the growth of foetus, and may lead to abruption of placenta, PPROM (Preterm premature rupture of membranes), premature delivery, low birth weight, and neonatal mortality.

**Aim:** The purpose of this prospective study is to show the importance of ultrasonography in cases of bleeding in first trimester.

**Objectives**: Ultrasonography in cases of bleeding in first trimester helps in

1) Precisely identifying the cause of vaginal bleeding

2) To assess the prognosis and to institute appropriate obstetric management.

**Methodology:**This was a hospital based observational study conducted in the department of obstetrics and gynecology, KMCH during the period of January 2021 to November 2022. The present study was conducted for the evaluation of first trimester bleeding using Ultrasonogram as a diagnostic tool and its correlation with pregnancy outcome.

**Results**: In this study, regarding concordance between clinical and ultrasound, for ectopic pregnancy 100%, for incomplete abortion 96.6%, for threatened abortion 66.7%, for missed abortion 50% concordance was

noticed. No concordance was observed for complete abortion,anembryonic gestation, and molar pregnancy. In this study, 100% accuracy was noticed between ultrasound diagnosis and final diagnosis. Of the total cases, 38.5% cases were managed with conservatively, 57.6% of cases had undergone instrumental evacuation, 2.6% of cases were managed with laparotomy, 1.3% of cases were treated with suction evacuation, and 2cases had undergone spontaneous abortion.

**Conclusion**: Bleeding per vagina during first trimester is the commonly observed symptom, which causes maternal morbidity and adversely affects the outcome. Ultrasound can be used to detect accurately the amount of bleeding, and the type of abortion. So, for timely management of early weeks bleeding ultrasound can be used with high accuracy. In this study also ultrasound had detected all the cases with high accuracy.

**Keywords:** first trimester bleeding, spontaneous abortion, ultrasound in first trimester, early pregnancy, pregnancy outcomes, ectopic pregnancy, implantation bleeding.

**Introduction**

Bleeding at first trimester is an independent risk factor for the outcome of the pregnancy, and it is proportional to the amount of bleeding. It can be a natural symptom of implantation, signs of spontaneous abortion or a pathological condition like ectopic pregnancy /gestational trophoblastic disease. Heavy bleeding may impede the growth of foetus, and may lead to abruption of placenta, PPROM (Preterm premature rupture of membranes), premature delivery, low birth weight, and neonatal mortality. [1-3]

Etiologies of first trimester bleeding can be divided into obstetric causes, gynecological causes, and non-gynecological causes.[4,5] Among the obstetric causes important ones are implantation bleeding, threatened miscarriage, subchorionic hematoma. Cervical malignancies and polyps of cervix are the Gynaecological causes of first trimester bleeding, whereas non gynecological causes of first trimester bleeding include Haematological disorders such as Von Willebrand Disease (VWD), and trauma.

According to the studies approximately one fourth of the pregnant mother's experience bleeding in the first trimester.[6] Nearly half of the first trimester bleeding leads to miscarriage. [7] As per some theories, during the period of early placentation, compromised invasion of cytotrophoblasts and remodeling of spiral arteries leads to miscarriages. [8,9]

Before the invention of various diagnostic modalities clinicians used to depend upon clinical examination, and pelvic examination, but most of the times it's not possible to get a accurate diagnosis. First trimester bleeding can be diagnosed by several diagnostic modalities. Of them, Ultrasonography (USG) is the best to diagnose first trimester vaginal bleeding at the earliest. USG is the safest as it is a non-invasive procedure without any radiation. It has an advantage of portability with high accuracy, and rapid in diagnosing the condition. Now a days both trans abdominal and transvaginal ultrasonograms are available.

**Aim and objectives**

**Aim**

The purpose of this prospective study is to show the importance of ultrasonography in cases of bleeding in first trimester.

**Objectives**

Ultrasonography in cases of bleeding in first trimester helps in

1) Precisely identifying the cause of vaginal bleeding

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## Methodology

This was a hospital based observational study conducted in the department of obstetrics and gynecology, KMCH during the period of January 2021 to November 2022. The present study was conducted for the evaluation of first trimester bleeding using Ultrasonogram as a diagnostic tool and its correlation with pregnancy outcome.

## Materials & Methods

### Study design

Observational study.

### Study setting

Katuri Medical College and hospital, Guntur.

### Study population

Married women who have bleeding per vaginum during first trimester and attended to outpatient department of obstetrics and gynecology department, Katuri Medical College and hospital, Guntur.

Study period: From January 2021 to November 2022

### Source of Data

80 obstetric cases attended Katuri medical college hospital with history of bleeding per - vagina in first trimester of pregnancy during the study period.

### Inclusion Criteria

Women who have vaginal bleeding in first trimester of pregnancy.

### Exclusion Criteria

Non obstetric causes for vaginal bleeding

Thisstudywas conducted inObstetricsandGynecologydept.ofKaturiMedical College, Guntur from January 2020 to November 2021 with 80 cases of first trimester vaginal bleeding.

## Results

This study was conducted in Obstetrics and Gynecology dept. of Katuri Medical College, Guntur from January 2021 to November 2022 with 80 cases of first trimester vaginal bleeding.
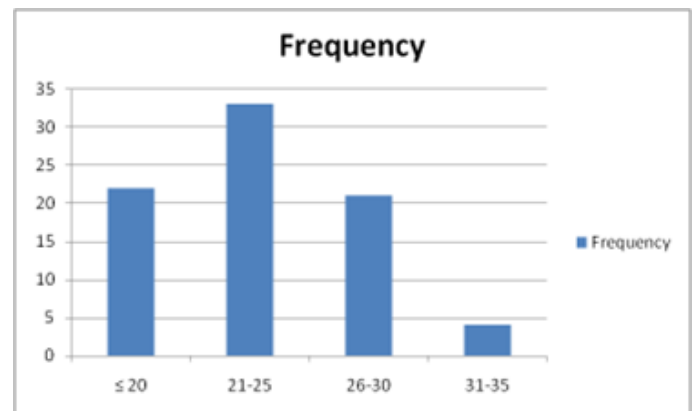
Table 1: Age distribution

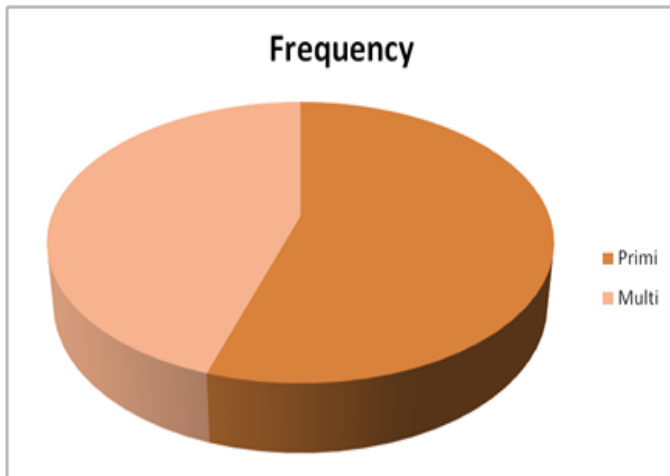| Age distribution (inyears) | Frequency | Percentage (%) |
|---|---|---|
| ≤20 | 22 | 27.4 |
| 21-25 | 33 | 41.3 |
| 26-30 | 21 | 26.3 |
| 31-35 | 4 | 5 |
| Total | 80 | 100 |

Figure1: Age distribution



In the present study, in ≤ 20 years, 22(27.4%) cases, in 21-25 years, 33(41.3%) cases, in26-30 years, 21 (26.3%) cases, and in 31 – 35 years,4(5%) of cases were distributed. Mean age of the total cases was 23.43 ± 3.51 years

Table 2: Based on gravidity

| Gravidity | Frequency | Percentage (%) |
|---|---|---|
| Primi | 44 | 55 |
| Multi | 36 | 45 |
| Total | 80 | 100 |

Figure 2: Based on gravidity



In this study, of the total cases, 44 (55%) cases were of Primi gravida and 36 (45%) cases were of multi gravida.

Table 3:Distribution based on clinical diagnosis

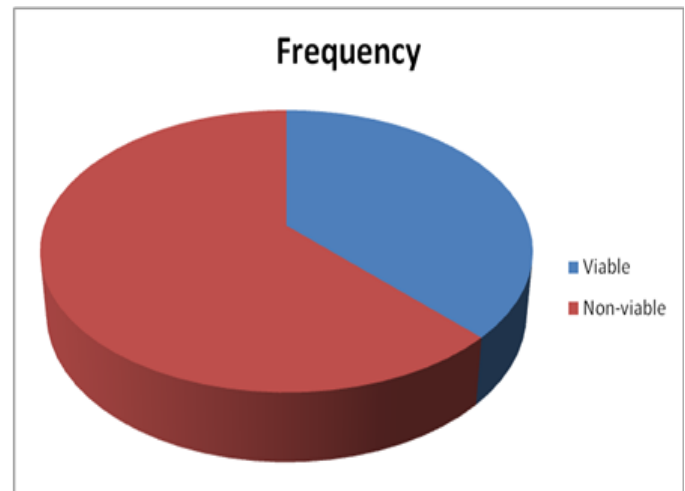| Clinical diagnosis | Frequency | Percentage (%) |
|---|---|---|
| Threatened abortion | 45 | 56.3 |
| Incomplete abortion | 29 | 36.3 |
| Missed abortion | 4 | 5 |
| Ectopic pregnancy | 2 | 2.5 |
| Total | 80 | 100 |

Figure 3:Distribution based on clinical diagnosis
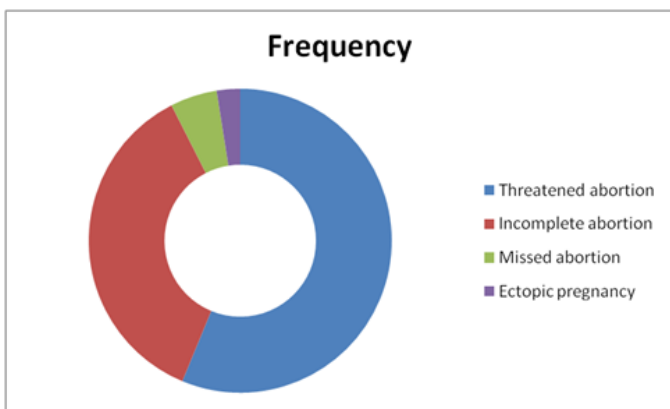


Of the total cases, on clinical Diagnosis, 45(56.3%) cases were diagnosed as threatened abortion, 29 (36.3%) cases were diagnosed as incomplete abortion, 4 (5%) cases were diagnosed as missed abortion, and 2 (2.5%) cases were diagnosed as ectopic pregnancy.

Table 4: Based on viability according to Ultrasound diagnosis

| Pregnancy | Frequency | Percentage (%) |
|---|---|---|
| Viable | 29 | 37.7 |
| Non-viable | 48 | 62.3 |
| Total | 77 | 100 |

Figure 4: Based on viability according to Ultrasound Diagnosis



Of the total cases, 48 (62.3%) of cases were non-viable and 29 (37.7%) cases were managed with viability. One case belonged to molar pregnancy, and 2 cases belonged to ectopic pregnancy.

Table 5:Ultrasound diagnosis of abortion

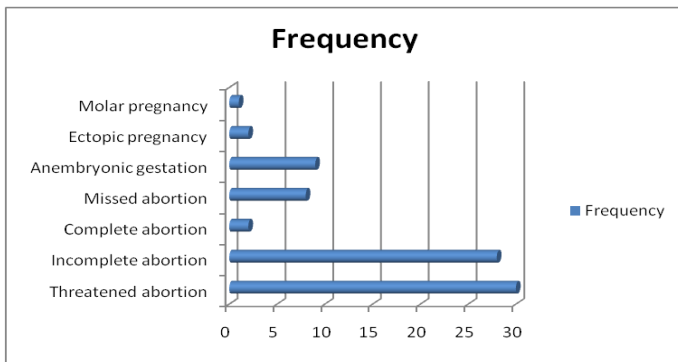| Ultrasound diagnosis | Frequency | Percentage (%) |
|---|---|---|
| Threatened abortion | 30 | 37.5 |
| Incomplete abortion | 28 | 35 |
| Complete abortion | 2 | 2.5 |
| Missed abortion | 8 | 10 |
| Anembryonic gestation | 9 | 11.3 |
| Ectopic pregnancy | 2 | 2.5 |
| Molar pregnancy | 1 | 1.3 |
| Total | 80 | 100 |

Figure 5: Ultrasound diagnosis of abortion

On ultrasound, in 30(37.5%) cases, threatened abortion, in 28(35%) cases, incomplete abortion, in 2(2.5%) cases, complete abortion, in 8(10%) cases, missed abortion, in 9(11.3%) cases, anembryonic gestation, in 2(2.5%) cases ectopic pregnancy, and in 1(1.3%) case, molar pregnancy was diagnosed.
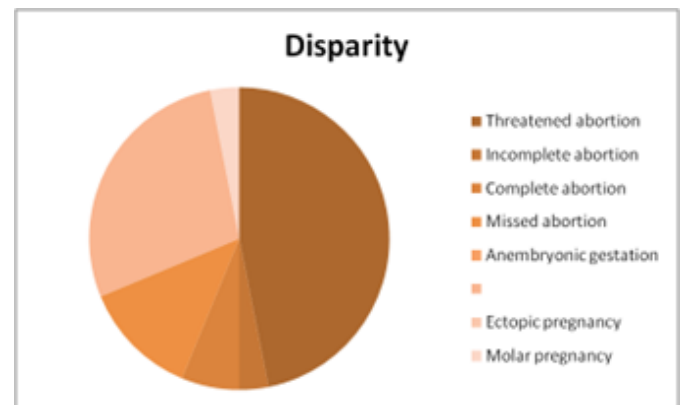
Table 6: Disparity between clinical diagnosis and ultrasound diagnosis

| Typeofabortion | Clinical diagnosis | Ultrasound diagnosis | Disparity | Concordance |
|---|---|---|---|---|
| Threatened abortion | 45 | 30 | 15 | 66.7% |
| Incomplete abortion | 29 | 28 | 1 | 96.6% |
| Complete abortion | 0 | 2 | 2 | 0 |
| Missed abortion | 4 | 8 | 4 | 50% |
| nembryonic gestation | 0 | 9 | 9 | 0 |
| Ectopic pregnancy | 2 | 2 | 0 | 100% |
| Molar pregnancy | 0 | 1 | 1 | 0% |
| Total | 80 | 80 | 32 | 68.7% |

Figure 6: Disparity between clinical diagnosis and ultrasound diagnosis
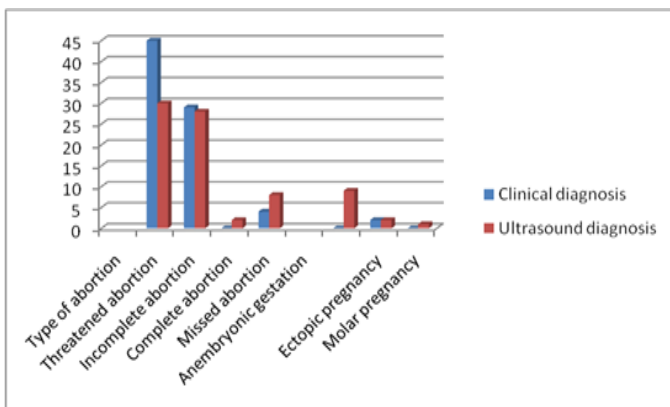


Disparity between clinical and ultrasound diagnosis for threatened abortion was observed in 15 cases, for incomplete abortion 1 case, for complete abortion 2 cases, for missed abortion 4 cases, for anembryonic gestation 9cases, for molar pregnancy 1 case, and for ectopic pregnancy no disparity was observed.



Regarding concordance between clinical and ultrasound, for ectopic pregnancy 100%, for incomplete abortion 96.6%, for threatened abortion 66.7%, for missed abortion 50% was noticed. No concordance was observed for complete abortion, anembryonic gestation, and molar pregnancy.

Table 7: Comparison among clinical diagnosis, ultrasound and final diagnosis

| Type of abortion | Clinical diagnosis | | Ultrasound diagnosis | | Final diagnosis | |
|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % |
| Threatened abortion | 45 | 56.3 | 30 | 37.5 | 30 | 37.5 |
| Incomplete abortion | 29 | 36.3 | 28 | 35 | 28 | 35 |
| Complete abortion | 0 | 0 | 2 | 2.5 | 2 | 2.5 |
| Missed abortion | 4 | 5 | 8 | 10 | 8 | 10 |
| Anembryonic gestation | 0 | 0 | 9 | 11.3 | 9 | 11.3 |
| Ectopic pregnancy | 2 | 2.5 | 2 | 2.5 | 2 | 2.5 |
| Molar pregnancy | 0 | 0 | 1 | 1.3 | 1 | 1.3 |
| Total | 80 | 100 | 80 | 100 | 80 | 100 |

Figure 7: Comparison among clinical diagnosis, ultrasound and final diagnosis
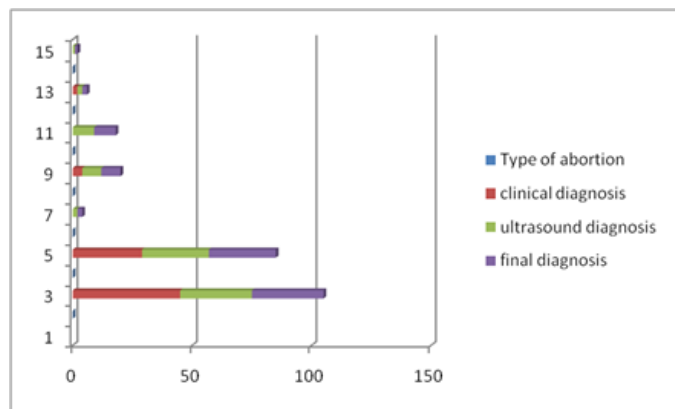


In this study, complete concordance was noticed between ultrasound diagnosis and final diagnosis.

Table 8: Management of first trimester bleeding cases

| Management | Frequency | Percentage (%) |
|---|---|---|
| Continued with conservative management | 30 | 38.5 |
| Instrumental evacuation | 45 | 57.6 |
| Laparotomy | 2 | 2.6 |
| Suction evacuation | 1 | 1.3 |
| Total | 78 | 100 |

## Discussion

### Age distribution

In the present study, in ≤ 20 years age group, 22 (27.4%) cases, in 21-25 years agegroup, 33 (41.3%) cases, in 26-30 years age group, 21 (26.3%) cases, and in 31-35years age group, 4 (5%) cases were distributed.

Table 9: Age comparison with other studies

| Age distribution (in years) | Shivanagpp A Metal.[16] | TiparseAetal.[37] | Present study |
|---|---|---|---|
| ≤20 | 27% | 28% | 27.4% |
| 21-25 | 46% | 39% | 41.3% |
| 26-30 | 23% | 23% | 26.3% |
| 31-35 | 4% | 6% | 5% |

### Mean age

Mean age of the total cases was 23.43 ± 3.51 years. In the present study, mean age of total cases was 23.43 ± 3.51 years, which was similar to Ara J et al.[12] (24.55±4.01), Kumar P et al.[10] (24 ± 4.16), Kushal Shah et al.[13] (26.9 ± 3.9 %), while contrast results were reported by Aronu ME et al.[11] (30.18 ± 5.38).

### Gravidity

In this study, 55%, and 45% cases were of Primi gravida and multi gravida, which was similar to Kamble PD et al.[14] (68%, 32%), while varied finding was stated by Sandya Shree PK et al.[15] (33%, 67%), Kumar P et al.[10] (30%, 70%) respectively.

Table 10: Studies showing comparison of Clinical diagnosis and USG diagnosis

| Study | Clinical Diagnosis | USG diagnosis | Disparity percentage |
|---|---|---|---|
| Ghoradeetal.[60] | 63 | 43 | 68% |
| Redd Irani P and Sunita V[49] | 100 | 58 | 42% |
| Sandya shree PK et al.[15] | 100 | 72 | 72% |
| Present study | 80 | 48 | 40% |

**Diagnostic accuracy**

In the present study, ultrasound was correlated with final diagnosis in 100% of cases, which was in accordance with studies by Mamtha et al.[20], Kurmi D et al.[18]

Table11:Comparisonofdiagnosticaccuracywithotherstudies

| Study by | Diagnostic accuracy |
|---|---|
| GuptaNetal.[19] | 96% |
| Mamthaetal.[20] | 100% |
| KurmiDetal.[18] | 100% |
| Present study | 100% |

**Management**

Ofthe total cases, 38.5% of cases were managed with conservative management,57.6% of cases had undergone instrumental evacuation, 2.6% of cases were managed withlaparotomy,1.3% of cases were managed with suction evacuation, and2cases had undergone automatic abortion.

In the present study, conservative management, instrument alevacuation, and laparotomy were done in 38.5%, 57.6%, 2.6% of cases, which was similar to Yadav V et al.[21] (46.1%, 49%, 4.9% respectively)., Kumar P et al.[10] (60%, 34%,6% respectively).

In this study, conservative management was done in 38.5% of cases, which was 19.3%in Kamble PD et al. study.[14]

Table 12: Comparison of management with other studies.

| Management | Kumar Petal.[10] Study | Yadav V et al. study[62] | Present Study |
|---|---|---|---|
| Conservative management | 60% | 46.1% | 38.5% |
| Instrumental evacuation | 34% | 49% | 57.6% |
| Laparotomy | 6% | 4.9% | 2.6% |

| Clinical diagnosis | BorahKKetal.[17] | Shivanag ppAM et al.[16] | Present pregnancy |
|---|---|---|---|
| Threatened abortion | 63% | 57% | 56.3% |
| Incomplete abortion | 13% | 31% | 36.3% |
| Ectopic pregnancy | 7% | 6% | 2.5% |
| Missed abortion | 10% | 4% | 5% |

Table 13: Comparison of clinical diagnosis with other studies.

**Conclusion**

Bleeding per vagina during first trimester is the commonly observed symptom, which causes maternal morbidity and adversely affects the outcome. Ultrasound can be used to detect accurately the amount of bleeding, and the type of abortion. So, for timely management of early weeks bleeding ultrasound can be used with high accuracy. In this study also ultrasound had detected all

the cases with high accuracy

**References**

1. Arfa M, Abdul Fataeh M, Zeid HA. Outcome of pregnancies complicated by early vaginal bleeding. East Mediters Health J. 2000; 6:457-64.

2. Johns J, Jauniaux E. Threatened miscarriage as a predictor of obstetric outcome. Obstet Gynecol. 2006; 107:845-50.

3. Mustafa G, Khurshid R, Mushtaq, ul Shamas I, Mir S. Pregnancy outcome of patients complicated by threatened abortion. Internet J Gynecol Obstet. 2009; 14:6932.

4. Lee L, McKenzie-McHarg K, Horsch A. The impact of miscarriage and stillbirth on maternal–fetal relationships: an integrative review. Journal of Reproductive and Infant Psychology 2017;35(1):32–52.

5. Sapra KJ, Joseph K, Galea S, et al. Signs and symptoms of early pregnancy loss: a systematic review. Reproductive Sciences.2017;24(4):502–13.

6. MarkD,AmyT. First trimesterbleeding.Am Fam Physician.2009;79:985-92.

7. Diana Basi E, Uduma F, Okere P, Edmund E. Obstetric sonography in first trimester bleeding (A single institution study). Merit Research Journal of Medical Sciences. 2016; 4:356-62.

8. Bever AM, Pugh SJ, Kim S, et al. Fetal growth patterns in pregnancies with first- trimester bleeding. Obstetrics and Gynecology.2018;131(6):1021.

9. PoonLC, ShennanA,HyettJA,etal.TheInternationalFederationofGy necology andObstetrics(FIGO)initiativeonpre-eclampsia:A pragmaticguideforfirst-trimester.

10. Kumar P, Mehrotra A, Gupta D, Mukharjee S, Saket R, Sinha P. First Trimester Bleeding: A Diagnostic Dilemma—Probing It with Ultrasound. Int J Adv Integ Med Sci 2017;2(3):117-124.

11. Aronu ME, Okafor CO, Mbachu II, Iloraah US, Ikeako L, Okafor CI. A Review of the Correlation between Clinical Diagnosis and Ultrasound Diagnosis in First Trimester Vaginal Bleeding. Ann Med Health Sci Res. 2018; 8:120-24.

12. Ara J, Dahiya K, Dahiya A. Study of maternal and perinatal outcome in women with first trimester vaginal bleeding. International J. of Healthcare and Biomedical Research. 2018 Jan;6(2):122-130.

13. Kushal Shah, Meena Priyadharshini V and Ameya Sir sat. Role of ultrasonography in cases of first trimester vaginal bleeding and its correlation with clinical findings: A prospective observational study. International Journal of Clinical Obstetrics and Gynaecology.2019; 3(5): 96-100.

14. Kamble PD, Bava A, Shukla M, Nandan Var YS. First trimester bleeding and pregnancy outcome. Int J Reprod Contracept Obstet Gynecol 2017; 6:1484-7.

15. Sandya Shree P. K., Swathi Nayak C. V.Clinical study of role of ultrasound in first trimester vaginal bleeding.Int J Reprod Contracept Obstet Gynecol. 2020 Oct;9(10):4010-15

16. Shivanag ppA M, Sagar SG, Manoli N. Ultrasound Evaluation of Vaginal Bleeding in First Trimester of Pregnancy: A comparative study with clinical examination. Int J Sc study. 2018, 3(7).1-3.

17. Borah KK, Phukan P, Choudhary C. Bleeding Per Vaginum in First Trimester of Pregnancy-Role of USG ItsCorrelation with Clinical Assessment. JMSCR Volume 04 Issue 02 2016 Feb;4(2):9573-81.

18. Kurmi D, Jadhav VR, Misri A, Mishra N, Prabhu S, Savani G. Role of pelvic sonography in first trimester bleeding. Journal of Evolution of Medical and Dental Sciences. 2015; 4(49):8516-25.

19. Gupta N, Samariya M, Choudhary D, Yadav K, Kannoujiya P. UltrasonographicEvaluation of First Trimester Bleeding per Vaginum.InternationalJournal of Reproduction, Contraception, Obstetrics and Gynecology.2016;5(1):3085-87.

20. Mamatha S, Sagar SG, Manoli N. Ultrasound Evaluation of Vaginal Bleeding in First Trimester of Pregnancy: A Comparative Study with Clinical Examination. Int J Sci Stud 2015;3(7):202- 6.

21. Yadav V, Santosh, Bharathi. Ultra sonographic evaluation and management of the first trimester bleeding.IOSR Journal ofDentalandMedical Sciences.2015;14(12):43- 6.