Ultra sonographic Evaluation and Management of the First Trimester Bleeding

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Abstract: *Accurate diagnosis of nature of the pregnancy (viable/non-viable) by ultrasound can avoid unnecessary complications and misdiagnosis in first trimester bleeding, thereby helps in appropriate management. The objective of our study is to evaluate the role of ultrasound in the accuracy of diagnosis and management of first trimester bleeding. We studied 102 cases of pregnant women who presented with bleeding per vaginum during the first trimester who referred to department of radio diagnosis in NMC and evaluated with clinical history, clinical examination, and ultrasonography. Out of 102 cases of first trimester bleeding 58 cases were diagnosed as threatened abortion clinically and ultrasound examination confirmed 40 cases. Out of 58 cases of threatened abortions 31 cases continued to term gestation with success full outcome of 30.4%. All cases of threatened abortion (n=45), Incomplete abortion (n=25), Complete abortion (n=11), Missed abortion (n=6), Ectopic gestation (n=6), Inevitable abortion (n=3), Hydatidiform Mole (n=3), Early Embryonic Demice (n=1), An-embryonic Gestation (n=2) and were correctly diagnosed on USG and managed accordingly. Out of 102 cases all 102 cases were correctly diagnosed on ultrasound with 100% accuracy and sensitivity compared to 65 out of 102 cases on clinical diagnosis with a disparity of 36.2%. In conclusion various types of abortions constituted the commonest cause of first trimester bleeding which were diagnosed correctly on ultrasonography with 100% sensitivity and accuracy and managed appropriately in present study.*
Key words: First trimester bleeding, Ultrasound examination, Clinical examination.

I.   Introduction

First trimester bleeding is any vaginal bleeding occurring during the first 12 weeks of pregnancy and by default it is considered as threatened abortion until a non-threatening cause is identified[1, 2]. It occurs in about a quarter of total number of pregnancies, approximately half of which will go for misscarriages[3] and other half will stop bleeding and complete a normal pregnancy[4]. Causes of first trimester bleeding are classified as obstetric and non-obstetric causes. Non obstetric causes include trauma, cervicitis, vaginitis, cystitis, cervical carcinoma or polyps. Obstetric causes include embryonic demise, sub chorionic haemorrhage, anembryonic pregnancy, incomplete abortion, ectopic pregnancy and gestational trophoblastic diseases[1, 2]. Only with clinical history and examination of the patients, it is impossible to arrive at definitive & accurate diagnosis is of cases.

Ultrasound imaging plays a major role in evaluation of pregnancies especially in the first trimester as it has not been found to cause any known biological side effects in the foetus at the usual diagnostic frequencies between 2.5 to 15MHz, even after extensive use in obstetrics for about fifty years[5]. Ultrasonography has opened new dimensions in the diagnosis of first trimester bleeding so that specific treatment with medical or surgical can be immediately instituted accordingly. Accurate diagnosis of nature of the pregnancy (viable/non-viable) can avoid unnecessary hormonal treatment and prolonged hospitalization to the patients, unnecessary curettages and its complications such as septicaemia. Ultrasound will guide clinician for early diagnosis of nature of pregnancy and thereby helps to appropriate management and to prevent unnecessary complications by misdiagnosis.

Because of its less demanding in terms of the physical infrastructure required, cost of equipment and consumables, the development and expansion of basic ultrasound services are more readily achievable than other imaging modalities[6]. The only drawback is that it is operator dependent, and diagnosis heavily relies on the expertise, technique, training and experience of the operator[6, 7, 8].
Most common indications of ultrasound during first-trimester are1:

- To confirm the presence of an intrauterine pregnancy.
- To evaluate pelvic pain.
- To evaluate a suspected ectopic pregnancy.
- To confirm cardiac activity.
- To define the cause of vaginal bleeding.
- To estimate gestational age.

- To diagnose or evaluate multiple gestations.
- As an adjunct to chorionic villus sampling, embryo transfer, and localization, and removal of an intrauterine device.
- To assess for certain foetal anomalies, such as anencephaly, in high-risk patients.
- To evaluate maternal pelvic masses and/or uterine abnormalities.
- To measure nuchal translucency when part of a screening program for fetal aneuploidy.
- To evaluate a suspected hydatidiform mole.

Sonography plays important role in determining a normal foetus is present, alive and to exclude other causes of bleeding such as ectopic pregnancy, molar pregnancy and risk of miscarriages which are associated with heavy bleeding during first trimester of pregnancy[9, 10, 11]. Keeping above in mind present study is undertaken to evaluate the role of ultrasound in the accurate diagnosis of causes of first trimester bleeding in pregnancy and the management of the condition.

Objectives:
- To evaluate the role of ultrasound in the accuracy of diagnosis and management of first trimester bleeding.

II.   Materials And Methods
Source of data:
Patients with bleeding per vaginum in first trimester of pregnancy, referred to the department of Radio diagnosis in Navodaya medical college hospital and research centre Raichur.

Method of collection of data:
We studied 102 cases of pregnant women who presented with bleeding per vaginum during the first trimester of pregnancy and referred to department of radio diagnosis, from department of Obstetrics and Gynaecology in Navodaya medical college hospital and research centre, Raichur for the period of 24 months. All patients were evaluated with history, clinical examination, and ultrasound as per standard guidelines.
All cases of threatened abortion were followed up till full term and delivery and follow up ultrasound was performed whenever indicated. Outcome and management of all the cases are noted.

Inculsion Criteria:
Patients presenting anywhere from first day of last menstrual cycle to 12 weeks of pregnancy with complaints of bleeding per vagina are included in study.

Exclusion Criteria:
- Women of reproductive age with a missed period with negative urine pregnancy test.
- Patients who refuse to get admit to the hospital.
- All non-obstetrical causes of vaginal bleeding
- All patients with more than 12 completed weeks of gestation

III.   Results:
As shown in the table.1 in the present study follow up of clinically diagnosed cases showed 58 suspected cases of threatened abortion of which only 40 cases were confirmed on sonography and 8 cases of incomplete abortion were misdiagnosed as threatened abortion. 5 cases of clinically diagnosed threatened abortion turned out to be complete abortion and 2 cases of each missed abortion and HM were misdiagnosed as threatened abortion. One case of clinically diagnosed threatened abortion was also turned out to be early embryonic demise. Out of 32 cases of clinically diagnosed incomplete abortion, only 15 were confirmed by sonography and 2 cases of each missed abortion and AG were mis diagnosed as incomplete abortion. 5 cases of clinically diagnosed IA were turned out to be threatened abortion in final diagnosis. 3 cases of complete abortion and 1 case of inevitable abortion were also misdiagnosed as incomplete abortion and 4 out of 32 were of ectopic gestation. 2 cases of each, ectopic gestation, missed abortion and inevitable abortion were diagnosed correctly on clinically correlates with ultrasonography diagnosis. One hydatidiform mole was correctly diagnosed clinically. One case of early embryonic demise and 2 cases of anembryonic gestation were diagnosed on ultrasonography, which were missed clinically. All the cases were diagnosed accurately on sonography when compared with clinical diagnosis.
As shown in the tables 2&3 40 out of 102 cases of suspected viable intrauterine gestation on clinical examination were confirmed whereas it has got high false positive cases (n=18).This shows a sensitivity of 89%, specificity 68%, PPV of 69% and accuracy of 77% with significant p value (<0.001).

Out the 2 ectopic pregnancies diagnosed clinically both cases were confirmed with specificity of 100% and PPV of 100% and other 4 cases of ectopic pregnancy were not diagnosed clinically turned out to be ectopic with 100% of sensitivity , NPV and accuracy with a significant p value (<0.000) on USG.

In diagnosing nonviable pregnancies, clinical diagnosis has got poor statistical correlation of sensitivity of 45%, specificity of 63%, NPV 53% and accuracy of 54% with p value of 0.05.

As shown in fig. 1, in our study, out of 102 cases 47(46.1%) cases were managed conservatively. All threatened cases were managed with bed rest either in the hospital or in the home. 50(49%) cases were managed with D&C and 5 (4.9%) cases out of 6 ectopic gestations were treated with laparotomy and terminated. Out of 3 cases of inevitable abortion, one case is spontaneously aborted on expectant management and other 2 cases were terminated with D&C. All the 6 cases of missed abortions, 8 cases of complete abortion, 3 cases of H. Mole, 2 cases of anemryonic gestation and one case of EED were managed with D&C.

31 out of 45 sonologically confirmed cases of threatened abortion were followed up to term gestation with successful outcome of full term normal delivery. 71 cases out of 102 cases are terminated on the basis of USG diagnosis. Some cases are managed conservatively and terminated on follow-up with repeated bleeding or spontaneously.

IV. Discussion

Ultrasonography is an excellent tool to assess the prognosis of the pregnancy like whether the safe continuation of pregnancy is possible or not, especially in subjects who present with a poor obstetric history, vaginal bleeding or abdominal cramps in early pregnancy who pose a diagnostic challenge to the clinicians and sonographers. Clinical history and pelvic examination are inadequate in assessing the cause of bleeding and the prognosis. Ultrasound (both TAS and TVS) plays an important role in the evaluation of the causes of the first trimester bleeding, prognosis and predict the status of abnormal pregnancy. Ultrasonography is a non-invasive modality which is extremely useful to arrive at an accurate diagnosis and management of cases appropriately.

In our study various types of abortions constituted major cause of first trimester bleeding (88.2%) whereas ectopic pregnancy contribute to 5.8%, H Mole contribute to 2.9% and others like AG & EED for making up of the rest of the cases with frequencies of 3.9% and 0.9% respectively. On comparing with previous studies done by P. Reddi Rani et al[12]. and Rama Sofat et al[13], slightly similar findings were observed in present study. Total number (88.2%) of abortions was slightly high in our study, and number of ectopic pregnancies and H. mole were slightly less compared to other studies. Our study result suggests that most common cause of first trimester bleeding is various types of abortions and ectopic pregnancies which contribute about 5.8%.

In our study, only 65 clinically diagnosed cases were confirmed on ultrasound with a disparity of 36.2%. The present study, when compared to study done by Jaideep malhotra et al[14], our study has got slightly more disparity between clinical and ultrasound diagnosis and less disparity when compared to study done by P Reddi Rani et al[12]

In our study, 45 cases of threatened abortion were diagnosed on ultrasound based on viability of foetus corresponding to 44.11% of cases of First trimester bleeding and managed appropriately (conservative management). Our study has shown similar findings compared to studies done by Nyberg et al[1] and Charles W Schauberger[15] et al.
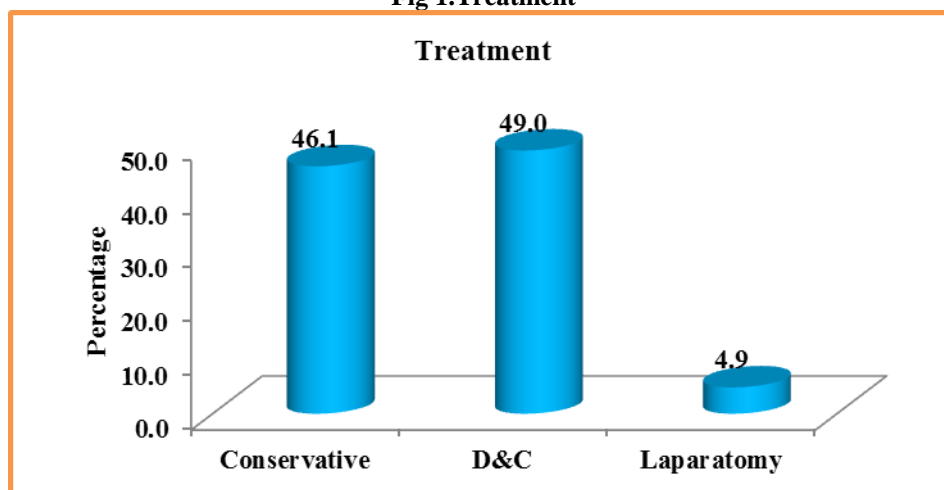
V. Figures and Tables:
Fig 1.Treatment

Fig1. Showing percentage of treatment modalities used in first trimester bleeding, D&C: Dilation and curettage

Table.1 Comparison of clinical diagnosis with USG diagnosis

USG Diagnosis	Clinical Diagnoses							Total
	CA	EG	IA	TA	In A	MA	HM	
CA	3	0	3	5	0	0	0	11
EG	0	2	4	0	0	0	0	6
IA	2	0	15	8	0	0	0	25
TA	0	0	5	40	0	0	0	45
In A	0	0	1	0	2	0	0	3
MA	0	0	2	2	0	2	0	6
HM	0	0	0	2	0	0	1	3
EED	0	0	0	1	0	0	0	1
AG	0	0	2	0	0	0	0	2
Total	5	2	32	58	2	2	1	102

CA=Complete abortion, EG=Ectopic Gestation, IA=Incomplete Abortion, TA=Threatened Abortion, In A=Inevitable Abortion, MA=Missed Abortion, HM=Hydatidform Mole, EED= Early Embryonic Demise, AG=An embryonic Gestation

Tables.2&3 Correlation & evaluation of clinical diagnoses with final diagnoses

Validity of Clinical Diagnoses with Final Diagnosis				
Parameters	True positive	False Positive	False negative	True negative
Viable intrauterine pregnancy	40	18	5	39
Nonviable intrauterine pregnancy	23	19	28	32
Ectopic Pregnancy	2	0	4	96

Parameters	Sen.	Sp.	PPV	NPV	Accuracy	P value
Viable intrauterine pregnancy	89	68	69	89	77	<0.001
Nonviable intrauterine pregnancy	45	63	55	53	54	0.05
Ectopic Pregnancy	33	100	100	96	96	<0.001

Sen=Sensitivity, Sp=Specificity, PPV=Positive predictive Value; NPV=Negative Predictive value and Accuracy, p<0.05 considered as significant

VI. Conclusion

Correct management of cases depends on correct diagnosis and in present study we found significant (36.2%) discrepancy between clinical and sonographic diagnosis. In the present study various types of abortions constituted the commonest cause of first trimester bleeding. All cases the cases were diagnosed correctly on ultrasonography with 100% sensitivity and accuracy and managed appropriately.

So ultrasound helped in establishing correct diagnosis timey and decides the line of management. Complete abortion can be only diagnosed by ultrasound and unnecessary curettage could be avoided. Although number of cases in present study was small but this gives valuable guideline for further investigation and management of such cases.

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