

Research Article

Role of Imaging in Early Pregnancy and Maternal Outcome

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A B S T R A C T

Introduction: The first trimester is crucial in pregnancy, often complicated by early vaginal bleeding, which can indicate threatened, incomplete, complete, or septic abortion. Occurring in 20% of pregnancies, 50% result in miscarriage, while the rest continue normally. This study evaluates early pregnancy bleeding using ultrasound and its correlation with maternal complications. **AIMS AND OBJECTIVES:** 1) To know the cause of early pregnancy bleeding using ultrasound as a tool. 2) To study their maternal outcome.

Methodology: This two-year observational study at a tertiary care center (June 2021-May 2023) included 100 women with a positive pregnancy test and first-trimester vaginal bleeding, from spotting to heavy bleeding. Women consenting were included, while those in the second or third trimester or who refused consent were excluded.

Results: In a study of 100 women, 57% were aged 21-25, with only 2% over 35 and 8% under 20. Consanguineous marriage occurred in 18%. Heavy bleeding affected 57%, and spotting 43%. Anemia (22%) and thyroid disorders (16%) were common complications. Abortions caused 69% of bleeding, ectopic pregnancies 28%, and molar pregnancies 3%. Ultrasound showed incomplete abortion in 52%, missed abortion in 32%, and other types in 16%. Treatments included dilatation and evacuation (41%), evacuation/Misoprostol (49%), and laparotomy for ectopic pregnancies (71%). All hydatidiform mole cases were treated with suction and evacuation.

Conclusion: The majority of early pregnancy bleeding is due to abortion, followed by ectopic pregnancy. Ultrasound, a non-invasive and accurate tool, aids in diagnosis and guides appropriate management, reducing morbidity.

Keywords: Imaging, First Trimester, Pregnancy Outcome

Introduction

First trimester is a very crucial period of pregnancy. Bleeding in early pregnancy is very often seen complication in labour room.¹ Bleeding in early pregnancy is defined as vaginal bleeding present during the first trimester of pregnancy and it may be threatened abortion, incomplete abortion, complete abortion, septic abortion.² It occurs in twenty percent of total number of pregnancies, among them fifty percent will end up in miscarriages³ and other fifty percent will continue a normal pregnancy.⁴ It is known to cause psychological and physical trauma to the women. Etiology of early pregnancy bleeding are divided into obstetric and non-obstetric causes. Obstetric causes include Missed abortion, sub chorionic bleed, Blighted ovum, incomplete abortion, ectopic & Molar pregnancy. Non obstetric causes include Injury to genital tract, Inflammation of cervix, vagina, bladder, cervical erosion or polyps. The main etiology being miscarriage, tubal ectopic and complete mole.

Imaging in the Early Pregnancy

In earlier days where ultrasonography (USG) was not available, the patients were diagnosed and treated only on clinical judgement.⁵ Now, in the present day scenario, USG has multiple advantages like confirmation of an intrauterine gestation, To know the cause of pelvic pain and to look for the site of suspected ectopic pregnancy, to look for fetal viability, to confirm the cause of early pregnancy bleeding, to date the pregnancy, to rule out multiple gestations. It is also very much helpful in chorionic villus sampling, measuring cervical length, amniocentesis, we perform TIFFA scan to know foetal anomalies, such as anencephaly, especially in diabetic women and elderly primigravidas, to find the maternal fibroids or ovarian cysts and/or uterine abnormalities, to measure nuchal translucency as a part of screening program for fetal aneuploidy, To evaluate a suspected hydatidiform mole.^{6,7,8} This study was done to evaluate the cause of early pregnancy bleeding using ultrasound as a diagnostic tool and its correlation with maternal complications.

Aims and Objectives

1. To know the cause of early pregnancy bleeding using ultrasound as a tool.
2. To study their maternal outcome.

Methodology

It was an observational study done at a tertiary care centre in 2 years period from June 2021- May 2023 with a sample size of 100 who fulfilled the inclusion criteria. All the women with positive pregnancy test. Bleeding observed from the vagina in the first trimester starting from spotting

to heavy bleeding. Women who gave consent were included and Antenatal women presented in second and third trimesters, Women who refused consent were excluded.

Observations

Out of 100 women, 57 % of them were in 21-25 years of age and 23% were between 26-30 yrs, 10 % of women belonged to 31-35 yrs of age and only 2% and 8% of women were more than 35 yrs of age and ≤ 20 years respectively. Figure 1

In the present study, 82% of women had non-consanguineous marriage and 18% had consanguineous marriage. 57% women had heavy bleeding and 43% had spotting pervaginum. Most common complication found was anemia which was seen in 22% of the women followed by thyroid disorders in 16%. About 48% of women did not suffer from any associated complication Table 1.

Abortions were the most common cause of bleeding and pain which was seen in 69% of women, followed by ectopic pregnancy which comprised of 28% and about 3% of women had molar pregnancy Table 2.

Based on both clinical and ultrasound findings incomplete abortion was seen in 52% of women, followed by missed abortion in 32%, blighted ovum in 7%, threatened abortion in 6% and only 4% women had a complete abortion Table 2.

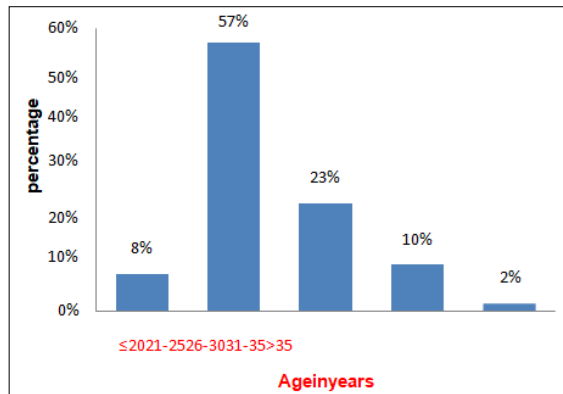
In our study, the more frequent etiology of ectopic gestation was miscarriage in the previous pregnancies (29%), Dilatation & Curettage (14%), Previous history of tubectomy (21%), Tubal surgeries (3.5%), Pelvic inflammatory disease (3.5%) and previous LSCS (29%) Table 3.

All the women diagnosed with gestational trophoblastic disease were complete moles.

Out of the women who had abortions, 41% of women who had missed abortion and blighted ovum were treated by dilatation and evacuation, out of which (61% of women had mechanical dilatation with evacuation and 40% of them received oral misoprostol followed by evacuation), 49% of women who had incomplete abortion were treated with Evacuation or Misoprostol (out of which 65% of women underwent evacuation 35% received oral misoprostol) and 6% of women who had threatened abortion continued the pregnancy (out of which 50% of women ended up in preterm delivery, 25% had second trimester abortion and 25% had intrauterine growth restriction). Finally 4 % of women who had complete abortion were advised contraception and followup.

71% of women with ectopic pregnancy underwent laparotomy procedure, and 11% were treated by laparoscopy. Conservative management was done for 14% of women, only 4% among the had diagnostic laparoscopy which was converted to laparotomy.

All the women with hydatidiform mole underwent suction and evacuation as the treatment.



(N=100)

Figure 1. Distribution of women according to age

Table 1. Distribution of women according To associated medical and obstetrical complications

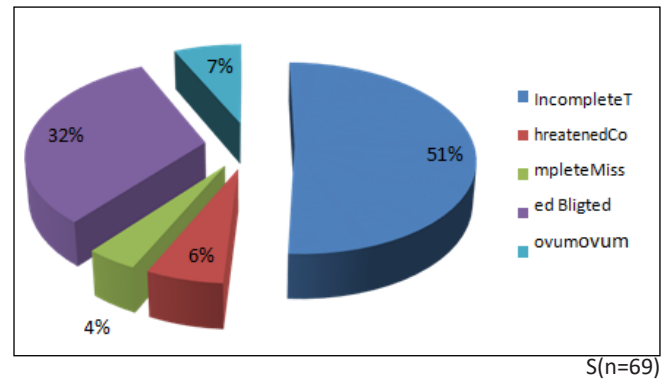
(N=100)

Medical & Obstetrical illness	Number of Women n=100	Percentage (%)
Anaemia	22	22
Thyroid Disorders	16	16
Asthma	1	1
Overt Diabetes Mellitus	3	3
Hypertension	1	1
Congenital Heart Lesion	1	1
Chronic Liver Pathology	1	1
Viral Pyrexia	1	1
Rh-Ve Pregnancy	1	1
Bicornuate/ Septate Uterus	3	3
Fibroid	2	2
Without any illness	48	48
Total	100	100

Table 2. Distribution of women according to clinical Diagnosis

(N=100)

Clinical Diagnosis	No of Women n=100	Percentage (%)
Abortions	69	69
Ectopic Pregnancy	28	28
Molar Pregnancy	3	3
Total	100	100



S(n=69)

Figure 2. Distribution of women according to types of abortion diagnosed on clinical and ultrasound finding

Table 3. Distribution of women according to risk factors in relation to ectopic pregnancy

(n=28)

Risk factors	No. of women (n=28)	Percentage (%)
Previous abortions	8	29
Dilatation and curettage	4	14
History of tubectomy	6	21
History of tubal surgeries	1	3.5
History of pelvic inflammatory disease	1	3.5
Previous LSCS	8	29
TOTAL	28	100

Discussion

AGE: In the present study, A total of 100 antenatal women were studied. We found that 57% of them were 21-25 yrs of age, 23% were between 26-30 yrs, 10% of women belonged to 31-35 yrs of age and only 2% and 8% of women were more than 35 yrs and ≤20 yrs respectively. When our study was correlated with study done by Vidya A Thobbi et al.,⁹ similar findings were found. In their study, Most of the women belonged to the age 21-25 yrs (46%) which was almost similar as our study followed by, (23%) between age group 26-30 yrs which is same as our study. Both extreme soft he age groups are related to increased risk of first trimester abortions. Women with age less than 20 yrs are at an increased risk of abortions due to malnutrition, anemia and associated related complications. In a study done by Clarisa R et al.,¹⁰ majority of the women having first trimester abortion were less than 20 yrs (28.3%) i.e

teenage pregnancies which when compared to our study it was only 8%. Increased age is an important risk factor for first trimester abortion because it results in increased chromosomal abnormalities, which in turn results in abortions. This was supported by the study conducted by Dai R et al.,¹¹ where majority of their women were above 35 years of age. This was not correlating with the present study, they had only 2% who were above 35 years of age. According to our observations, majority of them belonged to reproductive age, this was because the present study was done in an area, where early marriages are yet apart.

Consanguinity

In the present study, 82% of women had non-consanguineous and 18% had consanguineous marriage. Our study when compared with study conducted by Saad FA¹² showed that early pregnancy loss was not related to the consanguinity, first trimester miscarriages in consanguineous group when compared with non-consanguineous women were similar. In another study, done by Abdul Razzaq Y M et al.,¹³ there was an increased risk of abortion in women with consanguineous marriage, which was different when compared to our present study, there as on behind this was increased Congenital abnormalities, chromosomal abnormalities are incompatible with embryogenesis and organogenesis and can lead to early pregnancy miscarriage. In this study, most of them belonged to the non-consanguineous group due to increased awareness among the people and reduction in the consanguineous marriages in the developing countries.

Bleeding Per Vaginum

In this study, 57% of them had heavy bleeding and 43% had spotting per vaginum which was comparable to the study conducted by Reme Hassan et al.,¹⁴ where there were 4,510 participants, out of which 1,204 (27%) had early pregnancy vaginal bleeding or spotting. They also found that, eight percent of them having heavy bleeding episode had increased risk of abortion. In our study, it was also analysed that majority of the women i.e 64% had bleeding per vaginum for a lesser number of days when compared to the women who had increased duration of bleeding. As majority of the women had heavy bleeding per vaginum it resulted in their early visit to the hospital and early intervention. Bleeding during pregnancy especially heavy bleeding gives us a clue for and effect on placental development. Early placental insufficiency has many adverse pregnancy disasters, including abortions.

Associated Medical and Obstetrical Complications

Most common medical complication was anemia which was seen in 22% followed by thyroid disorders found in 16%,

overt diabetes mellitus in 3% of the women. Most common obstetrical complication seen was bicornuate/septate uterus (3%) and fibroids (2%). About 48% of women did not suffer from any associated complications. In a study done by Saleh HS et al.,¹⁵ they observed that fibroids occurred in 2% of women who had first trimester abortions. Many a times myomas in pregnancy do not show any symptoms, But, They can have Problems affecting pregnancy and labor like abortions, pre term labours, mal presentations, in coordinate uterine contractions, prolonged labour, post partum haemorrhage, increased operative delivery. So, antenatal period has to be cautiously screened, through regular check ups, to find any obstetrical complications and thus decrease the maternal morbidity. In another study done by Caserta D et al.,¹⁶ they found that Miscarriages (5.3%) are common in septate uterus. Bicornuate uterus, which was rarely associated with miscarriage in (2.1%) of the women, an increased risk was seen if these coexist (4.7%). In another study done by Githinji Di et al.,¹⁷ 13.4% of women had concurrent medical illness in which majority had hypertension (6.5%), 16% of the women were asthmatic both of which were much higher when compared to our present study where hypertensive women were 1% and women who had asthma were 1%, other disorders like HIV, urinary tract infections, epilepsy, allergies, peptic ulcer disease were also present which was not present in our study. The presence of associated medical and obstetrical complications has a vital role in planning management and also to know the course of post operative recovery of the women.

Clinical Diagnosis

In the present observations, Miscarriages were the most common etiology of bleeding and pain which was seen in 69% of the women, followed by ectopic pregnancy which comprised of 28% and about 3% of the women had molar pregnancy. Comparable observations were noticed by Shivanagappa M, in their study, where the major cause of first trimester bleeding was contributed by abortions constituting 83%. The other common etiology was ectopic gestation (13%) followed by vesicular mole (4%). In the reports by Bharadwaj N,¹⁸ also Miscarriage was the main etiology, incidence being 81%. These studies indicate that abortions are the major cause of first trimester bleeding followed by ectopic and hydatidiform mole. In our study incidence of ectopic was higher than that of Shivanagappa as our hospital being a tertiary care centre major number of cases were referred from peripheries.

Risk Factors in Relation to Ectopic

A meticulous history is mandatory among all antenatal women presenting with ectopic pregnancy, so that underlying pathology will be diagnosed. Our observation showed,

women who had history of abortions in the previous pregnancy had increased ectopic gestation (29%), Dilatation & Curettage (14%), previous history of tubectomy (21%), tubal surgeries (3.5%), pelvic inflammatory disease (3.5%), and previous LSCS (29%) were the other causes of ectopic. Our study was similar to study done by Shraddha Shetty K, Anil shetty K where they found history of previous abortions among 29%, Dilatation and Curettage done in 12.9%, previous LSCS in 12.9%, history of tubectomy in 3.2%, previous tubal surgery (salpingectomy) in 3.2% and PID in 3.2% of the women. In our study, major risk factor was women having history of abortion, which was comparable to observations noted in the study done by Arti GT¹⁹ where there were 28.57% of women having history of previous abortions. Similar results were also noticed in studies done Majhi AK, Roy et al (26.1%) and Mufti S et al.,²⁰ which was 21.05%. Other risk factors of the study included history of pelvic inflammatory disease, history of tubal surgery and history of infertility. As most antenatal women involved here belonged to reproductive age, there was also an increased incidence of abortions and Dilatation and Curettage procedures, increased sexual activity leading to higher pelvic inflammatory disease. This results show us the consequences of unsafe abortion i.e., change in the anatomy of fallopian tube, which in turn causing its dysfunction, and thus it is important to counsel the women to follow safe abortion protocols and post abortion care. Young women completing their family life and opting for tubectomy procedures at early age was also more in our present study. As in our study history of tubectomy was more, women should be counselled and told about the consequences of its failure and the risk of tubal pregnancy later.

Treatment

Present results show 41% of them who came with missed abortion and blighted ovum were treated by dilatation and evacuation (60% of women had mechanical dilatation with evacuation and 40% of them received oral misoprostol followed by evacuation). When our study was compared with Schwärzler P et al.,²¹ out of the 108 women who were included, 23 (21.3%) women underwent an Dilatation and curettage as soon as admission and 85 (78.7%) had medical management. After 4 weeks 71 (84%) of the women in the medical management group had a complete miscarriage and 14 (16%) of them required Dilatation and curettage.

Our study showed, 86% of the women underwent surgery as the main option of treatment For tubal Ectopic, while medical treatment was done in 14% of them, out of the 86% of women, 68% had total salpingectomy done, 18% had partial salpingectomy. this is comparable with the study conducted by Pusuloori R et al²² where Salpingectomy by laparotomy (86.25%) was the treatment of choice. In

their study very few women were managed medically and were successfully treated with a single dose injectable methotrexate. Here our hospital being a tertiary care centre most of the women were referred and they being ruptured ectopic pregnancy and were hemodynamically unstable we opted for surgical management as the main stay for treatment.

In our hospital, all the women with hydatidiform mole underwent suction and evacuation as the treatment. Serum beta HCG levels were measured 2 days after suction and evacuation and then repeated every weekly, until levels were undetectable. Later, follow-up measurements were made every month for another 6 months. All the women were advised to use contraceptive methods to avoid pregnancy for at least 6 months after beta HCG levels have come to normal in a Complete mole and for one year in gestational trophoblastic disease. None of the women in our present study developed chorio carcinoma. Our study was similar to study done by Al-Talib AA²³ where the treatment option was suction and curettage, irrespective of uterine size. One woman, who had high beta HCG titer (189,000 mIU/ml) at admission, was diagnosed to have an invasive mole and was treated with multidose Methotrexate therapy.

Conclusion

The majority of early pregnancy bleeding is due to abortion, followed by ectopic. We have Ultrasound which is non invasive, and easily available investigation to assess the cause of first trimester bleeding. Its diagnostic accuracy is very high and can assist the clinician at some instances. It further helps in deciding the appropriate management protocols and thus prevent morbidity in the women. Vaginal bleeding in the early pregnancy is associated with increased morbidity. In our present study 97% of the women had unfavourable pregnancy outcome, indicating that women with first trimester bleeding have a high risk for poor pregnancy. Ultrasound has a vital role in the treatment of women presenting with early pregnancy bleeding because it can help in distinguishing viable from nonviable pregnancies. But, We need to remember that ultrasound cannot replace our clinical judgement and should not replace obstetric history and clinical examination.

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Conflict of Interest: None

References

1. Creinin M D, Schwartz J L, Guido R S, et al. Early pregnancy failure—current management concepts. *Obstet Gynecol Surv.* 2001; 56(2):105–113.
2. Chen B A, Creinin M D. Contemporary management of early pregnancy failure. *Clin Obstet Gynecol.* 2007;50(1):67–88.

3. Paspulati R M, Bhatt S, Nour S G. Sono graphic evaluation of first-trimester bleeding. *Radiol Clin North Am.* 2008;46(2):437.
4. Mark Deutchman, Amy Tanner Tubay, David K. Turok. First trimester bleeding. *Am Fam Physician.* 2009 Jun 1;79(11):985-992.
5. Dighe, Manjiri, Carlos Cuevas, Mariam Moshiri, Theodore Dubinsky, and Vikram S. Dogra. "Sonography in first trimester bleeding." *Journal of Clinical ultrasound* 2008;36:352-66.
6. Paspulati R M, Bhatt S, Nour S G. Sonographic evaluation of first-trimester bleeding. *Radiol Clin. North Am.* 2004; 42: 297-314.
7. Hasan R B, Donna D, Herring A H, Olshan F, Jonsson F, Michele L H, Katherine E. Association Between First-Trimester Vaginal Bleeding and Miscarriage. *Obstetrics & Gynecology*, 2009;114:860-867.
8. Jaramillo, Susan. Mending broken lives: post-abortion healing. PhD diss., Regent University, 2017.;47:212-214
9. Thobbi, Vidya A., Gururaj Deshpande, U. A. Afreen, and Ruma Nooreen. "Ultrasonographic evaluation of first trimester vaginal bleeding." *Al Ameen J Med Sci*:9(2): 2016;107-111.
10. Gracia CR, Sammel MD, Chittams J, Hummel AC, Shaunik A, Barnhart KT. Riskfactors for spontaneous abortion in early symptomatic first-trimester pregnancies. *Obstetrics & Gynecology.* 2005;106(5):993-9.
11. Dai, Rulin, Linlin Li, Haibo Zhu, Dongfeng Geng, Shu Deng, and Ruizhi Liu. "Effect of maternal age on spontaneous abortion during the first trimester in Northeast China." *The Journal of Maternal-Fetal & Neonatal Medicine.* 2018;31(14):1824-1829.
12. Saad F A, Jauniaux E. Re current early pregnancy loss and consanguinity. *Reproductive bio medicine online.* 2002;5(2):167-70.
13. Abdulrazzaq, Y. M., A. Bener, L. I. Al-Gazali, A. I. Al-Khayat, R. Micallef, and T. Gaber. A study of possible deleterious effects of consanguinity. *Clinical genetics.* 1997;51(3):167-73.
14. Hasan R, Baird DD, Herring AH, Olshan AF, Funk ML, Hartmann KE. Association between first-trimester vaginal bleeding and miscarriage. *Obstetrics and gynecology.* 2009;114(4):860.
15. Saleh HS, Mowafy HE, Hameid AA, Sherif HE, Mahfouz EM. Does Uterine Fibroid Adversely Affect Obstetric Outcome of Pregnancy. *Bio Med research international.* 2018;2018.
16. Saleh, Hend S., Hala E. Mowafy, Azza A. Abd El Hameid, Hala E. Sherif, and Eman M. Mahfouz. "Does uterine fibroid adversely affect obstetric outcome of pregnancy?." *BioMed research international.* 2014Dec;8(1):130.
17. Githinji Di, Uon Mc. Sonographic Findings In Patients With First Trimester Bleeding and Related Associations In Nairobi 2013 Nov;11(2):1-2.
18. Bharadwaj N. Sonography evaluationas an ai din the management of bleeding in early pregnancy. *JObs tet Gynaecol India* 1988;38:640-2.
19. Arti Gupta Tuli, Sunita Goyal, David Livingston, Amritha Susan Kurian *Int J. Obstet Gynecol.* 2015Oct;4(5):1400-1403.
20. Mufti S, Rather S, Mufti S, Rangrez RA, Wasiqa K. Ectopic pregnancy: An analysis of 114 cases. *JKP ract.* 2012;17(4):20-3.
21. Schwärzler P, Holden D, Nielsen S, Hahlin M, Sladkevicius P, Bourne TH. The conservative management of first trimester miscarriages and the use of colour Doppler sonography for patient selection. *Human Reproduction.* 1999 May1;14(5):1341-5.
22. Pusuloori R, Arora KD. A comparative study of ectopic pregnancy at a tertiary care centre. *Int J Reprod Contra cept Obstet Gynecol* 2018;7:694-9.
23. Al-Talib AA. Clinical presentation and treatment outcome of molar pregnancy: Tenyears experience at a Tertiary Care Hospital in Dammam, Saudi Arabia. *Journal of family & community medicine.* 2016 Sep;23(3):161.