

ROLE OF ULTRASONOGRAPHY IN THE ASSESSMENT OF EARLY PREGNANCY

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ABSTRACT

Background: Early pregnancy after marriage strengthens the marital relations and improves the status of women in the family. This study was conducted to review normal embryonic development and to identify the sonographic features of early normal and abnormal pregnancies.

Material & Methods: This descriptive study was carried out at DHQ Teaching Hospital, Dera Ultrasound Clinic and Combined Military Hospital, D.I.Khan, from 1st January 2011 to 30th June 2011. Patients were advised to drink plenty of water for proper filling of urinary bladder. Patients with history of one to three months amenorrhea were studied.

Results: Out of 875 patients, 75(8.57%) were with no pregnancy, 501(57.25%) with normal single pregnancy, 5(0.57%) with abnormal single pregnancy, 18(2.05%) with normal twin pregnancy, 2(0.22%) with abnormal twin pregnancy, 4(0.45%) with normal triplets. Missed abortion were seen in 90(10.28%) patients along with 41(4.68%) incomplete and 37(4.22%) complete abortion cases. 34(3.88%) patients were seen with threatened abortion while 45(5.14%) were having blighted ovum. Hydatiform moles were seen in 11(1.25%) and ectopic gestations in 5(0.57%) cases. Malformed pregnancies were seen in 7(0.87%) patients.

Conclusion: Ultrasonography remains the imaging method of first choice for diagnostic evaluations in the first trimester routine and emergency patient.

KEY WORDS: Ultrasonography, Pregnancy, Early pregnancy.

INTRODUCTION

Since the introduction of Ultrasonography in 1942 by Austrian Neurologist Dussik, it has revolutionized obstetric diagnosis and enriched Gynecology with a valuable diagnostic method.¹ and it has rapidly replaced all other techniques used to study normal human development in the first trimester (before 13 weeks and 6 days of gestation). During the first trimester of pregnancy, transfer of single cell to recognizable human being occurs². The embryonic period, which have organogenesis, lasts for 8 weeks after conception and most malformation arise in this period. Ultrasonography had played a significant role in the diagnosis of all normal stages and problems of early pregnancy.³ Ultrasonography is currently the only available technique for the differentiation of normal from abnormal pregnancy. Several decades of conventional wisdom taught that "25% of all pregnancies will experience bleeding in the first trimester and of those 1/2 will abort." Such women were often told to go home, put their feet up and that they had a 50/50 chance of the pregnancy continuing.⁴ Several complication of early pregnancy like Molar Pregnancy, Blighted Ovum, Missed, Incomplete / complete abortion and Ectopic pregnancy can be detected accurately by U.S.G.¹

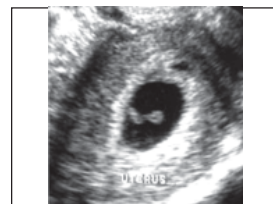
The first sonographic evidence of pregnancy is gestational sac within the thickened deciduous at 5th week's gestation.⁵ Between 5th & 6th weeks of gestation, the fetal pole and yolk sac appears in the gestational sac confirms the intrauterine pregnancy. Cardiac activity appears at 6th-7th weeks of gestation.



Gestational sac with fetal pole of five weeks age



Yolk sac in the gestational sac six weeks age



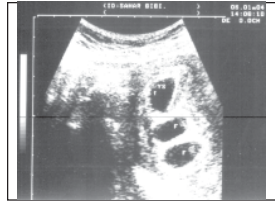
Fetal pole/yolk sac with + cardiac activity at seven weeks age



Eleven weeks normal intrauterine fetus



Twin alive intrauterine fetuses



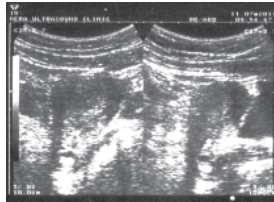
Normal alive triplets



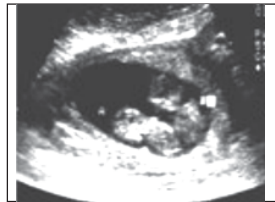
Free fluid in culde sac/ pelvis



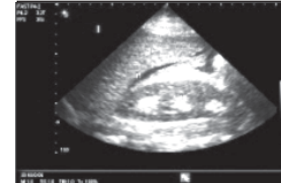
Right adnexal mass (ectopic pregnancy)



Empty uterine canal



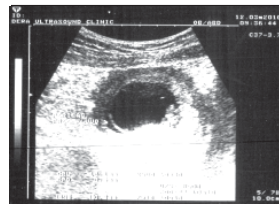
Mono amniotic sac with twins



Free fluid at hepato renal recess



Di-amniotic sacs with twins

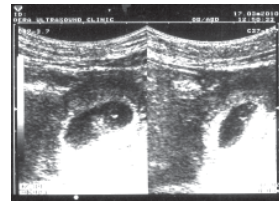


Threatened abortion

Certain sonographic features predict early pregnancy failure like gestational sac more than 20 mm size with no yolk sac or sac more than 25 mm with no embryo – favors- Blighted Ovum. Bradycardia (heart rate less than 85 beats per minute) in more than 7 weeks age embryo⁶, a small sac size relative to the embryo size⁷ (difference of less than 5 mm between gestational sac & crown / rump length) sub chorionic hematoma.⁸



Missed abortion 8w 6d - Missed non alive fetus

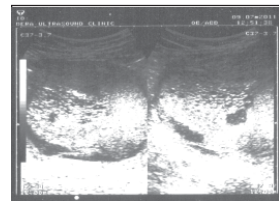


Missed abortion

With the clinical suspicion of ectopic, a normal scan or the presence of a simple cyst carries a low probability of ectopic (5%), while the probability is above 90% with a complex adnexal mass or a tubal ring. A live extra uterine embryo is diagnostic of an ectopic. Isolated free fluid in the pelvis is rarely the only sonographic finding.⁹



Anenchalic fetus

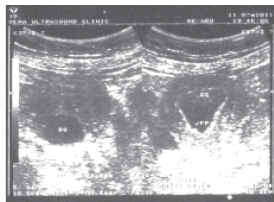


Hydatiform moles

Anencephaly, is one of the most common neural tube defects can often be diagnosed before birth through an ultrasound examination. and detailed fetal ultrasound can be useful for screening for neural tube defects such as spina bifida or anencephaly. Anencephaly occurs in about 4 out of 10,000 births.¹⁰

MATERIAL & METHODS

Eight hundred and Seventy Five cases of early pregnancy before 13 weeks of Gestational age being examined by Trans abdominal / pelvic Ultrasonography at DHQ Teaching Hospital, Dera Ultrasound Clinic and C.M.H. D.I.Khan from 1st January to 30 June, 2011. The Scans were performed by Toshiba Medical System Ultrasonographic Unit, Famio Cube with 3.5 MHZ Convex Transducer. Intra uterine pregnancies were diagnosed by presence of Product of conception with in the Uterine Cavity. Gestational age was estimated standard measurement of mean sac di-



Missed abortion 7w3d sac with only fetal pole



Blighted Ovum 9 weeks 4 days

ameter of Gestational sac, Crown rump length of embryo. Cardiac activity in live embryo by B Mode and M Mode study.

RESULTS

The findings of ultrasonography in 875 studied pregnant ladies are given in Table 1.

Table 1: Ultrasonographic findings.

Ultrasonographic findings	No. of cases	Percent-age
No pregnancy	75	8.57 %
Normal Single Pregnancy	501	57.25 %
Abnormal Single Pregnancy	5	0.57 %
Normal Twin Pregnancy	18	2.05 %
Abnormal Twin Pregnancy	2	0.22 %
Normal Triplet Pregnancy	4	0.45 %
Missed abortion	90	10.28 %
Incomplete abortion	41	4.68 %
Complete abortion	37	4.22 %
Threatened abortion	34	3.88 %
Blighted ovum	45	5.14 %
Hydatiform Moles	11	1.25 %
Ectopic pregnancy	5	0.57 %
Malformed pregnancy	7	0.87 %
Total	875	100 %

DISCUSSION

Performance of all the ultrasounds by single operator after receiving extensive training result in proper evaluation because the sensitivity for detection of fetal abnormalities increases after a learning curve of 3-4 years.¹¹ In 8.57 % patients ultrasonography, no pregnancy noted while in 57.25 % patients, normal single pregnancies seen at various stages of gestation. By U.S. G. threshold for fetal pole detection is in 5th weeks and for embryonic pole is at 5-6 weeks, when the mean sac diameter is between 5 & 12 mm.¹² Abnormal single pregnancies visualized in 0.57% patients having anencephalic ,hydrocephalic fetuses and numerous cysts in the fetal abdominal cavity. 2.05% patients were seen having normal twin pregnancies including 3 monoamniotic sacs while 15 of diamniotic sacs however 0.22% patients were also seen having abnormal twin pregnancies. In one case, at 10th weeks of gestation, two individual gestational sac were seen, one having normal alive fetus while in second sac, only the fetal pole /yolk

sac visualized with no further development while in second patient, one sac was with normal / alive fetus of 13 weeks age while in second sac, there was a dead fetus of 11 weeks age. Multiple normal pregnancies (triplets) seen only in 0.45% patients. The incidence of missed abortions seen in 10.28 % patients at 7-8th weeks gestation having fetal pole /yolk sac but no cardiac activity so declared missed.. The advantage of early diagnosis of missed abortion helps in planning for the elective treatment and hence reduces the chances of bleeding and emergency evacuation of retained products of conception.¹³ The yolk sac should be evident by 6 weeks. Cardiac activity should be evident by 7 weeks.⁴ In 4.68% patients of incomplete abortion, retained products of conception (POCs) visualized in lower uterine segment / cervical canal, a collection of blood / placental remnants in the shape of irregular mass. Few patients were also seen having retained peaces of fetal skeletal bones, while in 4.22% patients of complete abortion, all the product of conception were aborted with stasis of mild fluid /blood in the uterine canal. The patients with clinical diagnosis of threatened abortion but with absolute normal sonographic findings were also noted however in 3.88% cases the normal / alive fetuses seen between the age of 8th to 13th weeks with detachment of sac walls from the endometrium and free blood accumulation in between. The diagnosis of 5.14% cases of blighted ovum were made when there was absence of yolk sac or embryo in the GS when the MSD exceeded 20 mm¹⁵ Hydatidform mole, the usual form of trophoblastic disease, is common in this part of the world. We diagnosed 1.25% of this disease by the presence of snowstorm like echogenic echoes with multiple cystic spaces in between.¹⁶ In 0.572% cases of ectopic pregnancy, 3 had adnexal mass with hemoperitoneum and 2 had un ruptured tubal pregnancy without hemoperitoneum. In theory, an intrauterine sac can be distinguished from a pseudogestational sac because the former is located within the decidua, whereas, the latter is within the uterine cavity.¹⁷ In practice, the distinction is often difficult to make with certainty.¹⁸ The results of this study are consistent with study by Tuladhar et al.

CONCLUSION

Ultrasonography plays a vital role for the accurate diagnosis in the first trimester pregnancy with differentiating normal and abnormal / pathological pregnancies and therefore helps in proper management. Women who are considered high-risk or those who present with abdominal pain or vaginal bleeding in early gestation are more likely to be urgently evaluated with ultrasonography.

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