

Transvaginal ultrasonographic evaluation of ectopic pregnancy

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Abstract

Background: The advent of transvaginal scan (TVS) means more clinically stable women with EPs are diagnosed in time, well before surgery which is necessary in many cases. **Objectives:** To evaluate transvaginal sonography in detecting ectopic pregnancy. **Material and Methods:** This observational study was carried out on 90 cases presented in department of Radiodiagnosis and Imaging Sciences, Assam medical college and hospital from 1st August 2008 to 31st July August 2009. Preforma questionnaire was used for history and clinical examination was done. Sonography protocol as followed before doing TVS. Data was entered into Microsoft excel and analyzed using SPSS vs20. **Results:** Most ectopic 7 (53%) pregnancies were seen in 30-39 years age group, next common age group was 20-29 with 4 (30%) out of total 13 ectopic pregnancies. Maximum number of cases were seen in multipara and in the left side 69.23%. Mixed echogenic mass was seen in 76.92% on B scan. <1 Pulsatility index was 61.54% and index> 1 it was 38.46%. **Conclusions:** TVS is superior in detecting nature of ectopic pregnancies with accuracy. **Key Word:** Transvaginal Ultrasonography, ectopic pregnancy, Tubo-ovarian diseases

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INTRODUCTION

Diagnostic ultrasound had its foundation in the classical work of Rayleigh entitled "Theory of sound" published in 1877. Curie's discovery of piezoelectric effect in 1880 provided the mechanism whereby the sonic theory would eventually be applied to medical diagnosis.^{1,2} Introduction of transvaginal sonography has revolutionized the investigations of tubo-ovarian diseases. It allows high frequency transducers, producing much better resolution. To date, its most frequent use has been in the evaluation of ovulation and in oocyte recovery in infertile patients. Transvaginal sonography is performed

with a high-frequency transducer placed in the vagina where it is in close anatomic proximity to pelvic structures. The procedure overcomes difficulties in Transabdominal imaging of obese patients, those with a large amount of bowel gas, and those with inadequate bladder filling. With transvaginal transducer accurate assessment could be made in early embryos, ectopic pregnancies, incomplete abortions etc.^{2,3} Sonography provides direct evaluation of size, site and consistency of an ovarian pathology. The ability to distinguish between solid structure and one filled with fluid and another with mixed consistency makes the imaging technique an excellent screening procedure.⁴⁻⁶ Color and spectral Doppler ultrasound have evolved to play a role in assessing normal and pathologic blood flow. Doppler can also distinguish vascular structures from nonvascular structures such as dilated fallopian tubes or fluid filled bowel loops. Taking into consideration the advantages of transvaginal sonography and its application in the study of gynecologic diseases,^{6,7} this present study tries to depict the transvaginal sonographic appearances of tubo-ovarian diseases and correlate with operative or laparoscopic findings, biopsy findings and follow up scans in cases where conservative treatment is given.

MATERIAL AND METHODS

The present prospective study was carried out in the Department of Radiodiagnosis and Imaging Sciences, Assam Medical College and Hospital from a period of 1 year. All Outpatient Department and Indoor patients referred to the Department of Radiodiagnosis and Imaging Sciences, Assam Medical College and Hospital on clinical suspicion of tubo-ovarian diseases were selected for transvaginal sonography (TVS). Total of 90 cases formed the study sample. The sonographic machines used were Philips HD-11 real time scanner (using endovaginal transducer of 5-9 MHz and 2.5 MHz convex array transducers) A preformed proforma was used to take all relevant sociodemographic history also necessary clinical examinations were done. Before the start of the study ectopic pregnancy was defined for the study. Transvaginal sonographies (TVS) were done with empty urinary bladder. The transducer was prepared with ultrasound gel and then covered with a protective rubber sheath, usually a condom. Air bubbles were eliminated to avoid artifacts. An external lubricant is then applied to the outside of the protective covering. Transducer was inserted into the vagina with the patient supine, knees gently flexed and hips elevated slightly on a pillow. With gentle rotation and angulations of the transducer, both sagittal and coronal images could be obtained. Extreme angulations might be necessary to visualize the entire adnexa and cul-de-sac. Data was collected in Microsoft excel and analyzed using SPSS vr20.

RESULTS

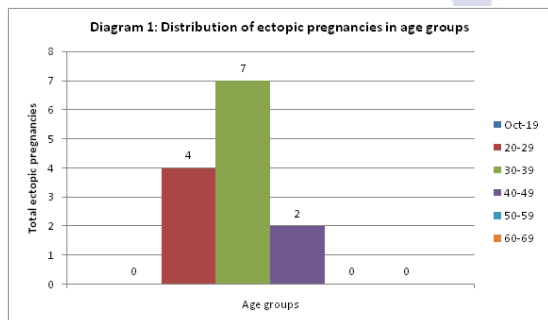


Figure 1: Distribution of ectopic pregnancies in age groups. Most ectopic 7 (53%) pregnancies were seen in 30-39 years age group, next common age group was 20-29 with 4 (30%) out of total 13 ectopic pregnancies.

Table 1: Distribution of ectopic cases as per side and parity.

Parameter	Total	Percentage
Side of Ectopic	Right	4
	Left	9
Parity of Patients	Primi	4
	Multi	9

Maximum number of cases were seen in multipara and in the left side 69.23%.

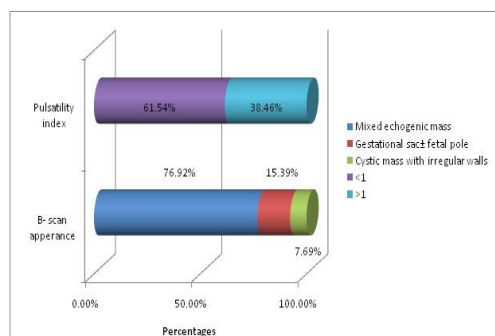


Figure 2: Distribution as per B scan appearance. Mixed echogenic mass was seen in 76.92%, gestational sac± fetal pole in 15.39% on B scan. <1 Pulsatility index was 61.54% and index> 1 it was 38.46%.

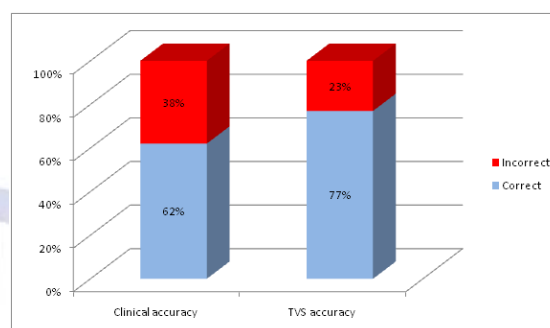


Figure 3: Distribution as per accuracy in clinical and TVS diagnosis. Accuracy of clinical examination to diagnose tubo-ovarian diseases was 70%. Overall accuracy of sonographic examination to diagnose tubo-ovarian diseases is 81%. Accuracy of transvaginal sonography is superior in comparison with clinical examination for diagnosis of different tubo-ovarian diseases.

Table 2:

Studies	Year	Percentage of accuracy	
		Overall	Ectopic Gestations
Kobayashi <i>et al</i> ¹	1969	77	75
Walsh <i>et al</i> ²	1979	80	60
Present Study	2008/09	81	77

DISCUSSION

The present study comprised 90 cases of tubo-ovarian diseases (both indoor and outdoor) referred to the Department of Radiology, Assam Medical College and Hospital, Dibrugarh. This study was carried out during the period from 1st August 2008 to 31st July 2009. Cases of all age group were included. In our study transvaginal sonography was able to diagnose 77% of ectopic pregnancies correctly. MudgalS *et al*⁸ found almost similar result (71%). One case of ectopic pregnancy was found in association with intrauterine pregnancy. According to Ratnam SS⁹, ectopic pregnancy may be concurrent with intrauterine pregnancy, but this is rare.

Soussis I *et al*¹⁰ report that their results confirm the findings by Cacciatori *et al*¹¹ that, when available, vaginal scanning is the most informative investigation in patients with suspected ectopic pregnancies. The most common transvaginal sonographic finding observed in ectopic pregnancy in our study is a mixed echogenic mass (10 out of 13 cases; 76.9%). Similar results were observed by Braffman BH *et al*.¹² Out of 13 cases 9 were multiparous. Similar findings were observed in a study by Seloda N *et al*¹³. Age group of cases was between 25-50 years in the present study. Seloda N *et al*¹³ found the commonest age group in their study between 25-35 years. Out of 13 cases, one case was found to have gestational sac of 7 w 4 d \pm 10 d of gestation with fetal pole which was detected nicely in TVS. A live extrauterine fetus has been detected with TVS in approximately 17-28% of patients with ectopic pregnancy¹⁴⁻¹⁸. Out of 13 cases trophoblastic flow signals (high velocity, low impedance) was found in 61.53% of cases. Taylor *et al*¹⁹ demonstrated trophoblastic flow signals (high velocity, low impedance) in 54% of ectopic pregnancy. On comparing the accuracy of diagnosis of various adnexal masses it was found that clinical examination could diagnose, ectopic gestation in 62% cases which are better than those of Levi *et al*²⁰ who reported 37% accuracy respectively. Transvaginal sonographic examination could accurately diagnose tubo-ovarian diseases in 77% cases in the present study which was comparable following studies.

CONCLUSION

We have found that transvaginal sonography is more superior over clinical diagnosis of ectopic pregnancy, so its always advisable to use transvaginal sonography along with clinical diagnosis to arrive at accurate diagnosis

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