Original Research Article

Transvaginal sonography of tubo-ovarian masses with clinical correlation

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Abstract

Background: Diagnostic ultrasound had its foundation in the classical work of Rayleigh entitled 'Theory of sound" published in 1877. TVS helps physicians in a better way in treating a patient by narrowing diagnosis. **Objectives:** To see the clinical correlation of transvaginal sonography of tubo-ovarian masses. **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:** In this study on 90 cases, most of the ovarian tumors were encountered in the 3rd and 4th decades with an average of 30.5 years. serous cystadenoma which constituted 27 (30%), incidences of benign and malignant was found to be 50 cases (83.33%) and 10 cases (16.67%) respectively out of total 60 neoplastic cases. In 30% of malignant ovarian tumors ascites is seen, whereas in only 6% of benign tumors ascites is noted. Overall accuracy of clinical examination to diagnose was 70% while accuracy of sonographic examination was 81%. Accuracy of transvaginal sonography is superior in comparison with clinical examination for diagnosis of different tubo–ovarian diseases. **Conclusions:** Accuracy of TVS was much better compared to clinical diagnosis of tubo ovarian diseases, so its always better to correlate clinical diagnosis with TVS for accurate diagnosis.

Key Word: Tubo-ovarian diseases, transvaginal sonography, Serous cyst adenocarcinoma

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INTRODUCTION

Tubo-ovarian diseases in female pelvis are very common over a wide age range and it is frequently difficult to arrive at an accurate diagnosis on clinical examination alone. History and clinical examination though important, can miss ovarian tumor andectopic gestation. Failure to make the correct diagnosis markedly enhances the risk to the patient, which become particularly grave if a false negative diagnosis delays laparotomy. It is not surprising that the study of gynecologic pathologies was one of the earliest application of B-scan ultrasonography. Sir Ian Donald (1958) pioneered the application of ultrasound in obstetrics and gynecology.[1-3] Since ultrasonography does not utilize ionizing radiation, it is preferred as a pelvic imaging technique in paediatric patients, in women of childbearing age and in pregnant women. 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 in to consideration the advantages of transvaginal sonography and its application in the study of gynecologic diseases,[6,7] this present study tries to

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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

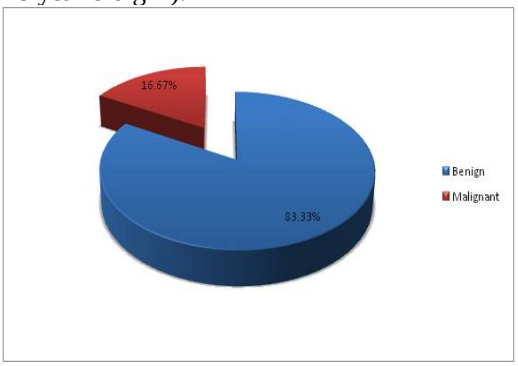
The present series of study was carried out in the Department of Radiodiagnosis and Imaging Sciences, Assam Medical College and Hospital from 1st August 2008 to 31st July August 2009. All Outpatient Department and Indoor patients referred to the Department of Radiodiagnosis and Imaging Sciences, Assam Medical College and Hospital on clinical suspicion of tubo-ovarian diseases were selected for transvaginal sonography (TVS). Total of 90 cases were selected. 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 history, clinical examination was done. All the operational definitions were defined before the study for various provisional diagnosis. 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 artefacts. 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.

RESULTS

Table 1: Distribution of pathologies as per age groups

Pathologies	Age Group (In Years)						Total
	10–19	20–29	30–39	40–49	50–59	60–69	
Serous cyst adenoma	3	12	9	2	1	0	27
Serous cyst adenocarcinoma	1	0	5	2	0	0	8
Mucinous cyst adenoma	1	2	0	1	0	0	5
Mucinous cyst adenocarcinoma	0	0	0	0	1	0	1
Undifferentiated carcinoma	0	0	1	0	0	0	1
Teratoma	1	9	5	1	0	0	16
Fibroma	0	0	0	1	1	0	2
Ectopic Pregnancy	0	4	7	2	0	0	13
Inflammatory	1	7	3	4	1	1	17
Total	7	34	31	13	4	1	90

Among the ovarian diseases most common tumor encountered was serous cystadenoma which constituted 27 (30%) cases among 90 cases of tubo-ovarian diseases. Benign were 80 (83.33%) and malignant were 10 (16.67%) Highest numbers of cases were seen in the age group 20–29 years followed by 30–39 years. The youngest patient encountered was 13 years old with serous cystadenoma. One case of serous cystadeno-carcinoma was found in the age group of 10–19 years (an 18 year old girl).



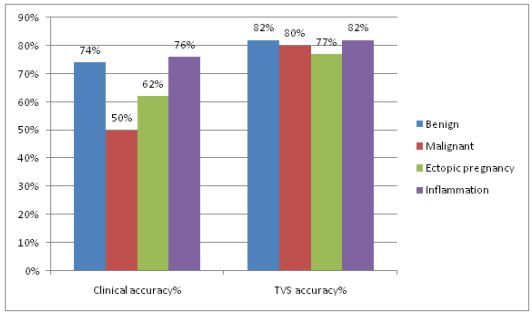


Figure 1: Distribution as per nature of ovarian tumours **Figure 2:** Distribution as per clinical and TVS accuracy

Benign tumours were 83.33% while malignant tumours were 16.67% in this study.

Table 3:

Authors	Year	Percentage (%) of accuracy				
		Overall	Ovarian Tumors		Ectopic Gestations	PID
			Benign	Malignant		
Thompson *et al*[224]	1967	84	80	76	—	81
Kobayashi *et al*[23]	1969	77	69	78	75	
Deland *et al*[24]	1979	93	93	93	—	—
Walsh *et al*[25]	1979	80	82	82	60	67
Present Study	2008/09	81	82	80	77	82

Overall accuracy of clinical examination to diagnose tubo-ovarian diseases is 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.

DISCUSSION

Of the 90 cases of tubo-ovarian pathologies in the present study 60 cases were ovarian tumor and most of the ovarian tumors were encountered in the 3rd and 4th decades with an average of 30.5years. The youngest patient encountered was 13 years old with serouscystadenoma. Prabhakar *et al*[8] reported that the youngest patient in his study was a 7 years old girl with dysgerminoma. Francisco etal[7]in his study found the youngest patient to be 7 years old with serous cystadenoma Sarkar *et al*[9]and Prabhakar *et al*[8] (1989) reported most of the cases in 3rd and 4th decades with an average of30.5 years, which was similar with the observations of the present study. As per the National Cancer Registry report, 1990-1996, the incidence of malignant ovarian tumors in different age were given for major cities across India, by correlating with these studies it could be stated that there is increased risk of ovarian cancer with increasing age. The incidence of cancer is greatly increased after 30 years of age. In this study we have found 83.33% benign pathology and 16.67% malignant pathologies. The frequency of benign and malignant ovarian neoplasmsin the present study was in agreement with that of Mudgal S *et al*[10] and Salem S *et al*[11]who got almost similar findings. Other studies also were in accordance with this study, the percentage of benign and malignant tumors were as follow in these studies in Prabhakar *et al*[8]it was 69% and 31%, in Sassone *et al*[12] it was 71.70% and 28.30%, in Salem S *et al*[11] it was 87.30% and 12.70% respectively. Kulkarni *et al*[13]got a higher incidence of surface epithelial tumors, than the findings in the present study. The present incidence of 70% almost tallied with the findings of Francisco *et al*[7](1993) who got incidence of 73.77%. Sarkar *et al*[9] and Dogra *et al*[14]got a lower incidence of surface epithelial tumors than the findings of the present study. Francisco *et al*[7]and Mahajan *et a1*[15] got highest incidence of serous cyst adenoma in the benign group, and it is also the common benign tumor recorded in the present study followed by mature cystic teratoma and mucinous cyst adenoma. Sarkar *et al*[9] in his study got mucinous cyst adenoma as the commonest tumor. Prabhakar *et al*[8] got mature cystic teratoma and mucinous cyst adenoma with almost the same incidence. In the malignant group serous cyst adenocarcinoma was the commonest tumor in the present study followed mucinous cyst adenocarcinoma and undifferentiated carcinoma. These findings correlated well with that of Francisco *et al*[7], Mahajan *et al*[15]and Prabhakar *et al*[8], who also reported serous cyst adenocarcinoma to be the most common followed by mucinous cyst adenocarcinoma. Almost similar findings were reported by Janovski NA *et al*[5], Out of total 90 cases of adnexal masses clinical diagnosis was correct in 63 cases (accuracy 70.00%). These observations are consistent with those of O'Brien *et al*[17], Sunden *et al*[18] and Voss *et al*[19]who reported accuracy of 67%, 69% and 68% respectively in their study.[156–158]Schlensker KH *et al*[20] reported higher accuracy (75.81%) whereas Levis *et al*[21] reported very low accuracy rate of 37%.On comparing the accuracy of diagnosis of various adnexal masses it was found that clinical examination could diagnose benign ovarian neoplasm, malignant ovarian neoplasm, tubo-ovarian masses, ectopic gestation in 74%, 50%, 76% and 62% cases respectively which are better than those of Levis *et al*[21]who reported 31%, 0%, 27% and 37% accuracy respectively. Transvaginal Sonographic examination could accurately diagnose tubo-ovarian diseases in 81% cases in the present study which was comparable to 84%, 77%, 93% and 80% respectively of Thompson *et al*[22], Kohayashi M *et al*[23], Deland *et al*[24]and Walsh *et al*[25]From the Table–3 below, it can be seen that the result of present study in diagnosing various tubo-ovarian diseases are consistent and comparable with other authors.

CONCLUSION

Transvaginal Sonographic examination could accurately diagnose tubo-ovarian diseases in 81% cases in the present study. It can be concluded from our study that Transvaginal sonography is an important tool for making an accurate diagnosis in various tubo-ovarian diseases for their further management.

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