

Diagnostic Accuracy of Transvaginal Versus Transabdominal Ultrasonography for Diagnosing Adnexal Masses

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ABSTRACT

Objective: Purpose of our study is to diagnose accuracy of transvaginal versus transabdominal ultrasonography for diagnosing adnexal masses.

Study Design: Cross-sectional/Comparative study

Place and Duration: Sadiq Abassi Hospital Bahawalpur. March 2021 - Oct 21

Methods: There were one hundred and twenty females were presented in this study. Females were aged between 18-55 years. As part of the informed written consent process, all of the patients were asked to provide demographic information including their age, gender, monthly abnormalities (Oligomenorrhea / Amenorrhea), infertility, recurrent pregnancy loss, hirsutism, and acne vulgaris and obesity. The location, size, borders, echogenicity, soft tissue component, septations, and nodularity of ovarian lesions were evaluated on a grey scale. Patients were equally divided into two groups, group I had 60 cases and received transvaginal ultrasonography while group II received transabdominal ultrasonography with MRI. Outcomes among both groups were compared in terms of frequency of adnexal mass by using histopathological findings (positive/negative). SPSS 25.0 version was used to analyze complete data.

Results: There was no any significantly difference between age and body mass index among both groups. Mean parity in group I was 2.34 ± 4.14 and I group II was 1.14 ± 7.38 . Infertility and irregular cycle was the most common complaints among both groups in 28 (46.7%), 26 (43.3%) and 21 (35%), 24 (40%). Frequency of adnexal mass in transvaginal ultrasonography was found among 32 (53.3%) but in group II (transabdominal ultrasonography) adnexal mass found in 36 (60%) cases. According to histopathological among 32 cases of transvaginal sonography 26 had true positive and 6 had false negative and in group II 32 cases had true and 4 cases had false positive results. We found that accuracy of transvaginal sonography was lower than that of transabdominal sonography in terms of specificity, positive predictive value and negative predictive value.

Conclusion: We concluded in this study that abdominal ultrasonography with MRI was more beneficial and effective in terms of diagnosing adnexal masses with authentic values of specificity and sensitivity.

Keywords: Adnexal Masses, Transabdominal ultrasonography, Transvaginal ultrasonography, Complications, Accuracy

INTRODUCTION

Adnexal masses, which affect women of all ages, are one of the most common pathologies. A wide variety of diseases, from benign to malignant and originating from both gynaecological and non-gynecologic origins, are represented by this group. Ovarian cancer is one possibility in the differential diagnosis of adnexal masses, and patients may be given further testing, such as tumor-marker tests, to help determine the exact type of the tumour. Because of this, a large number of patients have significant surgery because of the risk that they may have missed an ovarian cancer diagnosis. [1]

Adnexal masses may now be detected more easily because to the use of imaging tools in normal gynaecological practise. However, the intricacy of the clinical and imaging aspects of these lesions sometimes obscures an appropriate diagnosis. In order to avert fatal consequences, the clinician's first priority is to rule out malignancy. Approximately 7–13 percent of premenopausal women and 8–45 percent of postmenopausal women have an ovarian tumour that is malignant [2]. There is a 0.1 to 4.2 percent chance of ovarian cancer in women who have laparoscopy to remove preoperatively benign ovarian lesions [3-6].

For ovarian pathology screening, ultrasound has become a common method of diagnosis. For the purpose of detecting malignant ovarian tumours at an early stage, many scoring systems have been developed. It indicates that sonographic scoring of the ovarian lesion appears to have good sensitivity and specificity (89–100%), moderate positive predictive value (37–46%) and excellent negative predictive value (96–100%) [7,8].

Additionally, imaging is used to distinguish between benign and malignant ovarian tumours, as well as to identify abnormal imaging features that might indicate malignant disease. For women with suspicions of ovarian tumours, ultrasound is the go-to imaging

modality due to its accessibility, low cost and high specificity for detecting ovarian masses. Patients with obesity and ovaries that are outside of the transducer's focus zone have poor transmission of ultrasound pulses, and previous investigations using transabdominal ultrasonography for the examination of pelvic disease were unable to provide reliable findings. High-frequency transducers are used to provide improved resolution and a more complete examination of the female pelvis, particularly the reproductive organs. Ovarian tumours may now be studied more thoroughly thanks to transvaginal doppler ultrasonography.[11] Categorical endpoints include the detection of flow velocity waveforms on spectral Doppler and the presence or absence of flow on colour and power Doppler. Multiple locularity, the presence of papillary projections, thick septations, a solid component, and enhanced [12]vascularity on Doppler ultrasonography are all morphological traits related with a higher risk of cancer (USG). Ovarian masses may now be evaluated and classified using transvaginal Doppler ultrasonography [13,14]. These cystic lesions have been shown to have a very low risk of malignancy, according to research.[15]

We conducted this study compare the results between transabdominal versus transvaginal sonography among patients to diagnose specificity and sensitivity of adrenal masses.

MATERIAL AND METHODS

This cross-sectional comparative study was conducted at Sadiq Abassi Hospital Bahawalpur and comprised of 120 females. As part of the informed written consent process, all of the patients were asked to provide demographic information including their age, gender, monthly abnormalities (Oligomenorrhea / Amenorrhea), infertility, recurrent pregnancy loss, hirsutism, and acne vulgaris and obesity. Patients who had had surgery for an

adnexal mass, had a biopsy confirmed report, had a history of hypersensitivity to contrast agents, had a contraindication to contrast enhanced magnetic resonance imaging, or had any chronic illness were excluded.

Females were aged between 18-55 years. The location, size, borders, echogenicity, soft tissue component, septations, and nodularity of ovarian lesions were evaluated on a grey scale. Patients were equally divided into two groups, group I had 60 cases and received transvaginal ultrasonography while group II received transabdominal ultrasonography with MRI. We classified as malignant lesions ovarian masses with echo patterns such as papillary projection and solid components such as septations larger than 3 mm, loculations, free fluid, and metastatic deposit accumulations. When septations were less than or equal to 3mm, or if the bulk included fat, calcification was deemed benign. An abnormality was judged malignant if it showed high signal intensity on T1 pictures and low signal intensity on T2 imaging, as well as papillary projection, solid component septations larger than 3mm, and free fluid. All of the data were analysed by a radiologist who served as a consultant (with at least 5 years post-fellowship experience). All patients were subsequently operated on at the relevant surgical ward, and a specimen was submitted to the institution's laboratory for histopathology, where a consultant pathologist assessed the histopathology report.

Qualitative factors were analysed in terms of frequency and percentage. Transvaginal ultrasonography vs transabdominal sonographies were compared to determine the sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy of benign and malignant adnexal masses. SPSS 25.0 version was used to analyze complete data.

RESULTS

In group I mean age was 30.4±6.55 years with mean BMI 24.34±5.25 kg/m² and in group II mean age was 30.7±4.27 years with mean BMI 24.8±7.41 kg/m². Mean parity in group I was 2.34±4.14 and I group II was 1.14±7.38. Infertility and irregular cycle was the most common complaints among both groups in 28 (46.7%), 26 (43.3%) and 21 (35%), 24 (40%).(table 1)

Table 1: Demographics details and complaints of enrolled females

Variables	Group I	Group II
Mean age (years)	30.4±6.55	30.7±4.27
Mean BMI (kg/m ²)	24.34±5.25	24.8±7.41
Mean Parity	2.34±4.14	1.14±7.38
Symptoms/Complaints		
Infertility	28 (46.7%)	26 (43.3%)
Irregular cycles	21 (35%)	24 (40%)
Amenorrhea	7 (11.7%)	5 (8.3%)
Recurrent pregnancy loss	4 (6.7%)	5 (8.3%)

Frequency of adnexal mass in transvaginal ultrasonography was found among 32 (53.3%) but in group II (transabdominal ultrasonography) adnexal mass found in 36 (60%) cases.(Fig 1)

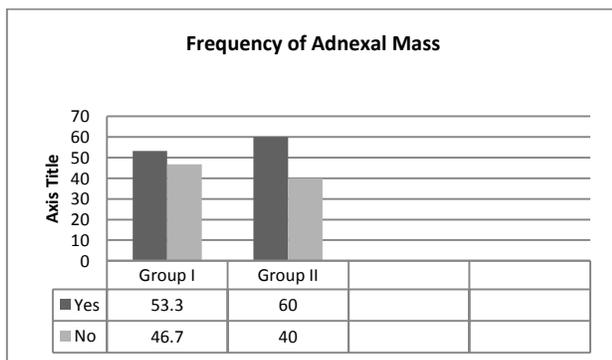


Figure 1: Comparison of accuracy for diagnosing adnexal mass among both groups

According to histopathological findings, among 32 cases of transvaginal sonography 26 had true positive and 6 had false negative and in group II 32 cases had true and 4 cases had false positive results.(table 2)

Table 2: Comparison of histopathological findings among both groups

Histopathological	Transvaginal	Transabdominal
True Positive		
Yes	26	32
False Positive		
Yes	6	4
True Negative		
Yes	8	5
False Negative		
Yes	20	19

We found that accuracy of transvaginal sonography was lower than that of transabdominal sonography in terms of intensity, specificity, positive predictive value and negative predictive value.(table 3)

Table 3: Comparison of accuracy with respect to specificity and intensity

Variables	Transvaginal	Transabdominal
intensity	83.4%	93.8%
specificity	82%	89.1%
positive predictive value	87.6%	92.5%
negative predictive value	79%	94.2%
Accuracy	84.4%	90.3%

DISCUSSION

Estimating the cancer risk is critical when deciding on the sort of surgery for a patient with an adnexal tumour. Unnecessary expenditures and complications may be avoided by doing laparoscopy or performing conservative treatment on benign tumours. Premature rupture of an ovarian cancer stage I may worsen the prognosis, on the other hand. [16] In order to determine whether an adnexal tumour is likely benign or perhaps malignant, sonography is an essential clinical imaging technique. This method of diagnosis has been shown to be very dependent on the skill and knowledge of the practitioner using it. When ultrasonography identifies worrisome masses, contrast-enhanced MRI may help narrow the field of diagnosis even more. For patients with normal or somewhat raised CA-125 levels, contrast-enhanced MR imaging provided the most useful information. [17]

In this comparative/cross-sectional study 120 females were presented with ages 18-55 years. Patients were equally categorized into two groups, transvaginal and transabdominal sonography with MRI was performed among cases. In group I mean age was 30.4±6.55 years with mean BMI 24.34±5.25 kg/m² and in group II mean age was 30.7±4.27 years with mean BMI 24.8±7.41 kg/m². Mean parity in group I was 2.34±4.14 and I group II was 1.14±7.38. These findings were comparable to the previous studies.[18,19] Mean parity in group I was 2.34±4.14 and I group II was 1.14±7.38. Infertility and irregular cycle was the most common complaints among both groups in 28 (46.7%), 26 (43.3%) and 21 (35%), 24 (40%). Our findings were comparable to the previous studies in which most common symptoms were infertility and irregular cycles.[20] Oligomenorrhea/absent menstrual cycle, irregular vaginal bleeding, acne, hirsutism, and obesity are some of the symptoms that the patient presents with. There is a high probability of recurrent miscarriages, infertility, type II diabetes, hypertension, and endometrial cancer among this group of individuals.[19,20]

Frequency of adnexal mass in transvaginal ultrasonography was found among 32 (53.3%) but in group II (transabdominal ultrasonography) adnexal mass found in 36 (60%) cases. According to Kroon et al., transvaginal sonography is ineffective in distinguishing between non-malignant ovarian cysts. The sonographic properties of these cysts are believed to be the cause of this poor diagnostic accuracy. When subsequent therapy is contingent on a histological diagnosis, keep in mind that one-third of ovarian masses are misdiagnosed with transvaginal ultrasonography. Diagnostic laparoscopy with histopathological

investigation by cystectomy is still necessary in cases where medical therapy has failed or expectant management according to onohistological diagnosis and in women who are considering assisted reproduction. [21] More than 90 percent of extra uterine tumours were correctly diagnosed as either benign or malignant by the ultra-sonographer in a multicenter research by Valentin L et al.[22]. 4 Yezbek et al. claim that skill in ultrasonography is a factor in correct diagnosis. [23]

We found that accuracy of transvaginal sonography was lower than that of transabdominal sonography in terms of intensity, specificity, positive predictive value and negative predictive value. Trans-abdominal ultrasonography has a sensitivity and specificity of approximately 80%, according to Benacerraf BR et al [24]. According to Marret H, the ultrasonic and molecular characteristics have an 80 percent and 93% specificity, respectively. [25] Trans-abdominal ultrasound has a sensitivity of 100%, specificity of 97%, and a positive predictive value (PPV) of 1.5% in the detection of malignant tumours in the adnexa. Magnitude resonance imaging was reported to provide a 95% sensitivity and 94.1 percent specificity for distinguishing adnexal masses in a research (benign versus malignant). [27] Gadolinium-enhanced MRI showed 94% of adnexal masses and had an overall accuracy of 93% for diagnosing malignancy in another research of 91 benign and 96 malignant adnexal masses. [28] Laparoscopic adnexal mass removal in 96 teenagers was studied by Yogni KD et al. Adolescent adnexal masses may be effectively and safely treated using laparoscopic surgery and ultrasonography, both of which were shown to be gold standards in preoperative evaluations to determine whether or not an object is benign in nature. [29]

Preoperative transabdominal Doppler ultrasonography has been shown to be a noninvasive modality of choice with a high diagnostic accuracy for distinguishing benign from malignant ovarian tumours, saving surgeons time and money by avoiding unnecessary operations.

CONCLUSION

We concluded in this study that abdominal ultrasonography with MRI was more beneficial and effective in terms of diagnosing adnexal masses with authentic values of specificity and sensitivity.

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