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ORIGINAL ARTICLE

Characteristics of Ovarian Cysts Observed in Doppler Ultrasound

SABA AKRAM[1], AASMA ASHRAF[2], ZAINAB ZAHUR[3], ANIQUA SALEEM[4], SAFIA ASHRAF[5], NADIA NAZIR[6]
[1]Assistant Professor, of Radiology in Avicenna Medical College, Lahore.
[2]Consultant Radiologist, Sir Ganga Ram Hospital Lahore.
[3]Consultant Radiologist, Atomic Energy Cancer Hospital, NORI, Islamabad.
[4]Senior Registrar Radiology Department, District Head Quarter Hospital, Rawalpindi Medical University.
[5]Assistant Professor Radiology, Gujranwala Medical College, Gujranwala.
[6]Consultant Radiologist, Aziz Bibi Hospital, District Kasur.
Correspondence to: Saba Akram, Email: sabaoptimist@hotmail.com, Cell: 03244183424

ABSTRACT

Background: Ovarian cysts known as ovarian masses, are commonly found incidentally in asymptomatic women. Ovarian cancer is the 7th most frequent cancer in women worldwide, as well as the eighth leading cause of cancer death. Ultrasonography is the principal imaging technique for confirming the mass ovarian origin and determining whether the mass is benign or malignant.

Method: This descriptive cross sectional study was conducted from 15 June to December 2019 in the Radiology Department of Avicenna Medical College. A total of 90 ultrasounds undertaken at the Gynecological Ultrasound Unit. A total of 32 patients with functioning ovarian cysts were included. A total of 46 individuals with benign tumors and 9 patients with malignant cysts were included in the control group. The remaining patients were not followed up on and were treated at a different center. The majority of the patients had issues with their menstrual cycle and pain.

Results: The mean age of the patients was 35.6+9.16. In functioning ovarian cysts, benign tumors & ovarian tumors. The functioning ovarian cysts had a mean size of 40.8 mm +16.35 mm. Differences were significant found between1this group & other1two groups: A mean size of 61.75 +65.5; P, 0.001 was seen for non-functional benign ovarian disease; and the average size of malignant cysts was 85.9 +50.6; P = 0.001. Out of 32 functional1ovarian cysts, 22 were found by ultrasonography, 8.0 were not identified and 2.0 cases were1diagnosed ultra-sonographically as functional ovarian cysts but histologically revealed to be benign ovarian cysts (non-functional). The sensitivity of color Doppler ultrasound was determined to be 82.0%.

Conclusion: The study's findings revealed that ultrasound had an 82 percent sensitivity in diagnosing ovarian masses, increasing its accuracy. As a result, ultrasonography appears to be the first modality of choice in the examination of any woman suspected of having an ovarian tumor. Also, to rule out the need for unnecessarily surgical procedures in benign lesions.

Keywords: Ovarian Cysts, cancer, ultrasound

INTRODUCTION

Ovarian cysts known as ovarian masses, are commonly found incidentally in asymptomatic women[1]. In the US, about 15.0% to 210.0% of female have their surgically ovarian cysts explored at some point in their lives, and only 13.0% to 21.0% of all these2cysts are malignant[2]. Ovarian cancer is the 7th most frequent cancer in women worldwide, as well as the eighth leading cause of cancer death[3].

In India, the frequency of ovarian cancer has been gradually increase in many registries, and it has already emerged the third/fourth most frequent cancer among women, however, death was the major cause of gynecological cancer[4].

In clinical practice, ovarian mass is a common problem of all gynecological carcinoma, ovarian carcinoma represents the largest clinical challenge. Ultrasonography is the principal imaging technique for confirming the mass ovarian origin and determining whether the mass is benign or malignant[5]. It compares morphologic pictures of ovarian masses to gross macroscopic pathologic characteristics. When morphologic characteristics alone are used to predict ovarian cancer, because there's a significant overlap between malignant & benign masses, there's a propensity to over diagnose malignant tumors.

Tumor flow can be detected using Doppler ultrasound. However, it has not been demonstrated to play a consistent function in cancer diagnosis[6]. Also, the patient population, imaging procedures & outcomes vary widely, making it more difficult to understand fully and measure the diagnostic capacity of present imaging modalities[7]. Ultrasound findings of cancerous ovarian tumors include, cysts with thicker and uneven walls, internal septae (>3 mm), vegetative or papillary projections, cystic lesions larger than 10 cm in dm, presence of solid components or lesions that are totally solid.

As a result, combining color Doppler imaging with pulsed Doppler spectrum analysis improves ovarian mass characterization by obtaining quantitative measurement of blood flow from tumor vessels, increasing the specificity & sensitivity of ovarian mass characterization[8]. The rationale of the study, to find the frequency of ovarian cyst observed in Doppler ultrasound.

MATERIAL AND METHODS

This descriptive cross sectional study was conducted from 15 June to December 2019 in the Radiology Department of Avicenna Medical College, Lahore. A total of 90 ultrasounds undertaken at the Gynecological Ultrasound Unit. A total of 32 patients with functioning ovarian cysts were included. The study included pre- and postmenopausal women who had both ultrasonography and histology reports of ovarian masses. During the study period, medical records (ultrasound reports) for ovarian masses were reviewed. If an ultrasound revealed an

ovarian mass but no histology report patients were excluded. Data was entered in SPSS. Age, tumor type & size was presented as mean and SD. Anova test were applied. P value less than 0.05 was considered as significant.

RESULTS

The mean age of the patients was 35.6+9.16. In functioning ovarian cysts, benign tumors & ovarian tumors, the average age was 34.8+10.1, 33.23+11.2, and 42.4+11.34, respectively. In individuals with non-functional benign ovarian disease, there was no significant variation in this parameter, Patients with malignant ovarian cysts were substantially older, with a P0.001 difference between the two groups.

The functioning ovarian cysts had a mean size of 40.8 mm +16.35 mm. Differences were significant found between this group & other two groups: A mean size of 61.75 +65.5; P, 0.001 was seen for non-functional benign ovarian disease; and the average size of malignant cysts was 85.9 +50.6; P = 0.001.

The presence of diffuse internal echoes was less frequent in functional ovarian cysts in comparison with the groups with non-functional benign ovarian pathology or malignant cysts (37, 71.2, 53.2% respectively). This difference was statistically significant (P, 0.01). Table: 1.

Intra-cystic septal structures were found less frequently in functional ovarian cysts (42.5%) than in individuals with non-functional benign ovarian disease (59.1%) or malignant cysts (63.3%). Furthermore, the septal structures of functioning ovarian cysts were narrower (3.2 mm) than those of other groups (>3.0 mm; P 0.005).

Malignant cysts (78.7%) were more likely than non-functional benign ovarian cysts to have a heterogeneous pattern (43%), functional Ovarian Cysts are less common than nonfunctional Ovarian Cysts (7.5%). The difference in diagnostic group heterogeneity was significant statistically (P 0.01). The value of Papillae as shown in Table 1.

Out of 32 functional ovarian cysts, 22 were found by ultrasonography, 8.0 were not identified and 2.0 cases were diagnosed ultra-sonographically as functional ovarian cysts but histologically revealed to be benign ovarian cysts (non-functional). The sensitivity of color Doppler ultrasound was determined to be 82.0%. Ultrasound has a specificity of 98.2 percent in ruling out the presence of ovarian functional cyst.

Table 1: Ultra sonographic features in each study group

			Ultrasonographic characteristics (%)					
	Age(Years)	Tumor(Size)	Anechogenic pattern	Diffuse internal echoes	Septa	Heterogeneic pattern	Papillae	Solid Pattern
Functional Cyst	34.8+10.1	40.8 mm +16.35	47.7	37	42.5	7.5	0.89	0.91
Benign (Non-functional cysts)	33.23+11.2	61.75 +65.5	15.5	71.2	59.1	43.1	8.3	12.9
Malignant Cysts	42.4+11.34	85.9 +50.6	4.1	53.2	63.3	78.7	57.4	57.3

DISCUSSION

Ultrasound plays a crucial role in the diagnosis of adnexal abnormalities, with a sensitivity of more than 90% & a specificity of 51.0-97.0% for cancer[9-11]. Numerous sonographic criteria have been proposed for characterization of adnexal lesion, like indexing morphologic & ultrasound findings, as well as classification systems based on the presence of specific ultrasound findings[12,13]. Proper image based measures & individual evaluation based on the imager's experience may be used to characterize of cystic adnexal lesions or guide recommendation.

Ovarian cysts are common type of ovarian lesions in females who are still in their reproductive years. In Europe, commonly ovarian cancer cause of mortality from gynecological cancers & 4th common cause of death in females[14,15]. Although the exact prevalence in Pakistan is unknown, ovarian cancer is the third most frequent malignancy in Pakistani females & continues to emerge at advanced ages[16,17].

The functional ovarian cysts percentage showing pattern of cystic disease of such ovary was 12.9 percent among all females we investigated. However, it is important to remember that the majority of them disappear with menstruation & hence may escape medical attention.

Ultrasound diagnostic ability in the diagnosis of a functioning clear ovarian cyst & when the ultrasound features are depicted in 98.2% cases the final diagnosis will be a functional ovarian cyst.

The gynecologist has to know the characteristics of ultrasound functional1ovarian cysts and how they progress so that un-necessary surgery may be avoided & patients with unexplained infertility can get some answers.

CONCLUSION

The study's findings revealed that ultrasound had an 82 percent sensitivity in diagnosing ovarian masses, increasing its accuracy. As a result, ultrasonography appears to be the first modality of choice in the examination of any woman suspected of having an ovarian tumor. Also, to rule out the need for unnecessarily surgical procedures in benign lesions.

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