

Role of Ultrasonography in Evaluation of Pelvic Mass in Female

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Abstract

Introduction: Ultrasonography is one of the best non-invasive diagnostic tool to evaluate the size, consistency and gross structure of a pelvic mass. In very difficult situation when the pelvic examination cannot reach any specific diagnosis, ultrasonography can help by both functional and morphological information reliability of ultrasonography in various pelvic masses in female.

Objectives: To observe the role of ultrasonography (USG) in evaluation of pelvic mass.

Materials and Methods: This observational study was carried out on 110 patients over a period of 2 years from January 2014 to January 2016 who reported to surgical and Gynae out patient department (OPD) in Medical College for Women and Hospital (MCWH), Dhaka and Catharsis Hospital, Pubail, Dhaka. All patients underwent pelvic ultrasonography and findings were compared with actual status of the patients and finally confirmed by histopathology after operation.

Results: Total 110 patients of pelvic masses were evaluated out of which 88 patients were found to be ultrasonographically positive and the remaining 22 were negative and out of these 88 patients 84 were histopathologically confirmed. Out of 22 ultrasonographically negative patients, 08 cases were found to be histologically confirmed.

Conclusion: Pelvic masses is one of the common complaints in gynaecological cases. Proper clinical assessment is the mainstay of diagnosis and addition of routine abdominal ultrasound by graded compression technique can improve the diagnostic accuracy and adverse outcome.

Key-words: Ultrasonography, Pelvic mass.

Introduction

Pelvic ultrasound is a noninvasive diagnostic examination which allows quick visualization of the female pelvic organs and structures including the uterus cervix, vagina, fallopian tubes and ovaries. The most widely used methods of pelvic ultrasonography are transabdominal real time scanning and transvaginal real time scanning. In transabdominal scanning most often uterus and ovaries are visualized by using 3MHZ transducer at a depth of 10-15 cm through urinary bladder whereas with transvaginal sonography the same structures are visualized at depth of 1-8 cm & 5-7 MHZ transducers are used.

Transvaginal sonography unquestionably provides excellent depiction of pelvic organs¹⁻⁶.

In transabdominal scanning using a low frequency transducer, a full bladder is used to displace bowel gas and serve as an acoustic window to improve image resolution. Ultrasound is used in distinguishing the origin of pelvic masses whether uterine or adnexal and whether pelvic masses are cystic, solid or mixed⁷⁻⁸. Some ultrasound machine have endovaginal transducers that are capable of colour flow imaging. This feature is usually seen in more expensive machines. This capabilities can help in localizing vessels within the pelvis and in determining blood flow to the organs, as is required to diagnose or exclude ovarian torsions⁹⁻¹³.

Materials and Methods

A study of 110 patients having different pelvic masses in women was conducted during January 2014 to January 2016 in MCWH Dhaka and Catharsis Hospital, Pubail, Dhaka. After taking complete clinical history, general, and binamual pelvic examination was performed, Ultrasonography of pelvis was performed for all the patients by real time equipment with 3.5 MHZ transducer using transabdominal route. All patients were asked to drink 02 litres of water one hour before sonographic procedure. To allow proper examination, the patient was asked to lie on an examination table in supine position keeping lower abdomen and suprapubic area uncovered. The transducer was placed over the bladder and pubic area in the midline and determination of the size and location of uterus, cervix, vagina and ovaries were done and their relation to the pelvic masses were noted down. The consistency of the pelvic mass whether cystic or solid were also confirmed in both transverse and sagittal plane. These scans were obtained at 1 or 2 cm interval and the bladder contour and any fluid in pouch of douglus was also noted. Post operative histopathology examination was done in 92 cases. Post-operative histopathological finding clinched the final diagnosis. If sonography findings matches with histopathological reports the result is considered to be confirmatory but if histopathological reports is negative then the result is considered as negative.

Results

Clinical diagnosis of different pelvic masses found out of 110 cases 39(35.5%) cases was adnexal cyst followed by leiomyoma (17.3%) and pelvic inflammatory disease (14.5%) (Table-I). By histopathology examination 92(83.6%) cases were confirmed but 18(16.4%) cases were found negative (Table-II). Table-III shows 84(76.4%) true positive, 08(7.3%) false positive, 04(3.6%) false

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negative and 14(12.7%) true negative. So 92 were total positive cases and 18 were total negative cases.

Table-I: Clinical distribution of pelvic mass (n=110)

Clinical Diagnosis	Frequency	Percentage
Adnexal cyst	39	35.5
Leiomyoma	19	17.3
Pelvic inflammatory disease	16	14.5
Haematometra	10	9.1
Tubal ectopic pregnancy	10	9.1
Hydatidiforma mole	06	5.5
Uterine malignancy	05	4.5
Polycyst ovarian disease	05	4.5
Total	110	100

Table-II: Comparison of ultrasonic finding with histopathology (n=110)

Diagnosis by USG	Histopathology findings		Total Cases
	Positive	Negative	
Adnexal cyst	35(89.7)	04(10.3)	39
Leiomyoma	13(68.4)	06(31.6)	19
Pelvic inflammatory disease	11(68.7)	05(31.3)	16
Haematometra	10(100)	0	10
Tubal ectopic pregnancy	07(70)	03(30)	10
Hydatidiforma mole	06(100)	0	06
Uterine malignancy	05(100)	0	05
Polycyst ovarian disease	05(100)	0	05
Total	92(83.6)	18(16.4)	110

Table-III: Distribution of cases as per status of disease.

Diagnosis		By Histopathology		Total
		Positive	Negative	
By Ultrasonography	Positive	84(76.4)	08(7.3)	92(83.6)
	Negative	14(12.7)	04(3.6)	18(16.4)
Total		98(89.1)	12(10.9)	110(100)

Discussion

In this study the aim was to evaluate the diagnostic accuracy of ultrasonography in different pelvic masses in women. There were 84 true positive cases, 14 true negative cases, 08 false positive cases and 04 false negative cases. So it is evident from this result is that correct diagnosis was made in 98 (89.09%) cases and misleading result was in 12 (10.90%) cases; the sensitivity, specificity and accuracy was 94.45%, 63.63%, and 89.09% respectively which is lower than Voss et al¹⁴.

Ronald Et al¹⁵ confirmed the clinical diagnosis by ultrasound in 36.8% and sonography established the diagnosis in 59% of cases. Some authors found pelvic sonography and clinical examination to be equal in accuracy for determination of size, position of pelvic mass and superior in prediction of solid or cystic nature of such masses. Quillin Et al¹² reviewed 300 gynecological cases

and found that 74% to be confirmatory and 05% were classified as misleading cases. When the pregnancy test is negative the different diagnosis of gynecologic pelvic mass in young female is leiomyoma, ovarian cyst and endometriosis. In cases with positive pregnancy test or available BHCG result will rule out pregnancy complications like ectopic pregnancy. Distortion of bladder or uterine contour could demonstrate myomas. Clustered bright echoes suggested calcification and produce distal acoustic shadowing but it was difficult to distinguish myomas by ultrasound from sarcoma or other uterine neoplasm. Ultrasonography revealed hematomas as slightly enlarged ovary are probably physiologic, large unicolor ones may be cystic adenomas.

Benign teratoma, multiloculated cystadenoma, endometriosis and corpora lutea usually have characteristic appearances. It is possible to suspect malignancy on the basis of ultrasonic image but a definite diagnosis cannot be always made. Benacerref Et al¹⁶ reported a 73% positive predictive value for excluding malignancy. Benign tumors usually have sharp well-defined margins and are more likely to be anechoic. Indistinct border and the presence solid echoes pattern suggest malignancy and as echogenicity increases so does the possibility of malignancy although ascites is usually present when a malignant tumor involves peritoneum. Headlock¹⁷ opines that the sonography of female pelvis should not be expected to provide histological diagnosis. Direct visualization of tubal pregnancy gestational sac outside uterine cavity or rarely a definite extra uterine fetus could be visualized. The criteria for ectopic pregnancy described by Kimz et al¹⁸ which includes absence of intra uterine sac with serum BHCG of more than 1000 mg/l and an adnexal mass and free fluid in abdomen.

Conclusion

Ultrasonographic examination can identify those pelvic masses that are missed on physical or clinical examination, on the other hand, the identification of a very tiny lesion may lead to increased patient's concern and operation if done may be proved to be unnecessary. The diagnostic accuracy is significantly high if the clinical science and symptoms are combined with ultrasonographic findings. We recommend USG as a valuable tool in evaluation of gynaecological pelvic mass in spite of prevalence of expensive investigation like computed tomography (CT) & laparoscopy, thus reducing the cost of treatment.

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