

Transabdominal Ultrasonographic Evaluation of Pelvic Masses and Comparison with Transvaginal Ultrasonography

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DOI: <http://dx.doi.org/10.21276/ijcmsr.2019.4.3.19>

How to cite this article: V. Tamilarasan, Md. Ameen, Vinay Jadhav. Transabdominal ultrasonographic evaluation of pelvic masses and comparison with transvaginal ultrasonography. *International Journal of Contemporary Medicine Surgery and Radiology*. 2019;4(3):C86-C89.

A B S T R A C T

Introduction: Pelvic masses of gynaecological or non-gynaecological origin are one of the common conditions encountered in clinical practice. Trans vaginal Ultrasonography plays a vital role in confirmation and classification. But due to its limited availability, clinicians in resource poor settings, often rely on transabdominal ultrasonography. Present study assessed the diagnostic accuracy of Transabdominal Ultrasonography, as compared to Transvaginal Ultrasonography.

Material and methods: A diagnostic accuracy study was conducted for one year. Total of 80 participants who presented with history, symptoms, and signs suggestive of pelvic mass were recruited. Sensitivity and specificity and predictive values were calculated.

Results: Majority (47.5%) of the lesions were of uterine origin as per USG sites. Transabdominal USG diagnosis showed 28.75% of lesions to be originating from ovaries. Transvaginal USG diagnosis depicted 48.64% of fibroid cases. Transabdominal ultrasound had a sensitivity of 92.00% and a specificity of 100% in diagnosing fibroid. It showed an overall sensitivity of 93.34% and specificity of 100%. In diagnosis of ovarian lesions, Ultrasonography by using IOTA scoring system showed 98.45% sensitivity and 100% specificity.

Conclusion: Transabdominal sonography has proved to be a very useful highly diagnostic and a reliable method with good sensitivity and specificity.

Keywords: USG diagnosis, IOTA Scoring System, Pelvic Masses

INTRODUCTION

The female pelvis is a complex anatomical region, comprising of few important organs and systems performing different and independent functions. The uro-genital system and portions of other organs and systems usually generate pelvic masses even in para-physiologic conditions.¹ Most pelvic masses are diagnosed through classical physical examination, including rectovaginal examination. Ultrasound plays a vital role in diagnosis and classification of symptomatic and sometimes asymptomatic pelvic masses.²

Pelvic masses may present with wide range of clinical findings or sometimes may remain asymptomatic and diagnosed accidentally during routine pelvic examination. The classic complaints observed are pain, pressure sensations, dysmenorrhea, or abnormal uterine bleeding. Considering pelvic masses as acquired lesions, a few emerge as congenital anomalies. Laboratory tests prove less informative in the evaluation of pelvic masses, but levels of serum β -human chorionic gonadotropin (hCG) or tumor markers may be helpful. The treatment protocol has variations depending on symptoms, age, and risk factors related to patient.³

Most pelvic masses are diagnosed through classical

physical examination, including rectovaginal examination and Ultrasound can reveal asymptomatic pelvic masses.² Sonography usually provides clinically important parameters for the evaluation of pelvic mass. Pelvic sonography can confirm the presence or absence of a suspected pelvic mass.⁴ Transvaginal sonography is suggested as the first line imaging modality for reproductive age women with acute pelvic pain due to accessibility, lesser ionizing radiation and efficiency in identifying female reproductive tract disorders.⁵ Transabdominal approach in obstetrics and gynaecology is conducted to identify possible pelvic pathology or pregnancy in a less invasive manner.⁶

The present study was conducted with aims and objectives to study the Transabdominal and Transvaginal Ultrasonographic findings of various pelvic masses, to know the sensitivity, specificity and reliability of Ultrasonographic Findings of pelvic masses, and also to know the sensitivity, specificity and predictive value of ultrasonography of Benign and malignant masses.

The present study was conducted to study diagnostic utility of Transabdominal Ultrasonography against transvaginal ultrasonography in diagnosis of various pelvic masses.

MATERIAL AND METHODS

Study was done on 80 cases who presented with history, symptoms, and signs of pelvic mass were recruited from SRM medical College and Hospital, Trichy. It was a one year study from April 2018 to March 2019. Patients were properly counselled and gave informed consent before entry into the study.

Study procedure: All of them were subjected to Transabdominal Ultrasonography with full bladder technique with C1-5 MHz probe and then Transvaginal Sonography with empty bladder technique with E8CS MHz except for the unmarried female patients. TAB and TVS was performed with the use of GE LOGIQ P9 Diagnostic Ultrasound System. Observations included size, shape and echo texture of the pelvic masses in sagittal and transverse planes. IOTA scoring system was applied to differentiate benign and malignant ovarian tumors.

Female patients [pre pubertal to post-menopausal] of all age group presenting with symptoms like pain in abdomen/pelvis, PV bleeding, PV white discharge, urinary and gastrointestinal pressure symptoms and palpable mass and those pelvic mass detected at time of routine pelvic examination or at the time of Ultrasonography [Transabdominal and Transvaginal Sonography] done for other diagnosis were included in study. Women on ovulation induction drugs and Normal Pregnancy were excluded from study.

STATISTICAL ANALYSIS

Transabdominal USG was considered as gold standard. Transvaginal was considered as screening test. The sensitivity, specificity, predictive values and diagnostic accuracy of the screening test along with their 95% CI were presented.

RESULTS

The maximum number of cases were in the age group of 31 – 50 years and the minimum number were in the age group of 61 – 70 years.

Majority (40%) of participants had DUB. The proportion of Pelvic mass, Cx mass, Mass P/A was 36.25%, 6.25% and 5% respectively. PID and Lt. Ov torsion was 3.75% for each respectively. (Table 1)

Majority of the lesions were uterine origin (47.5%). The proportion of Left ovary, Cervix, Right ovary was 11.25%,

6.25% and 10% respectively, Endometrial cavity and Right adnexa was 7.5% for each respectively. (table 2)

Majority (45%) had fibroid on Transabdominal USG Diagnosis, followed by Ovarian lesions was 28.75%, Adenomyosis, Endometrial polyp and Ca Cervix was 5% for each respectively. Majority (48.64%) had fibroid on transvaginal USG Diagnosis, followed by Ovarian lesions was 29.2%, Adenomyosis, Endometrial polyp and Ca Cervix was 5.4% for each respectively. (Table 3)

Among the study population, 4 (11.12%) participants had sub serosal fibroid, 29 (80.55%) participants had Intramural

USG Site of Lesion	No. of Cases	% of Cases
Uterus	38	47.5
Cervix	05	6.25
Endometrial cavity	06	7.5
Right ovary	08	10
Left ovary	09	11.25
Bilateral ovaries	02	2.5
Right adnexa	06	7.5
Left adnexa	04	5
Pelvis	02	2.5
Total	80	100

Table-2: Descriptive analysis of USG site of lesion in the study population (N=80)

Transabdominal USG Diagnosis (N=80)	No. of Cases	% of Cases
Fibroid	36	45
Adenomyosis	4	5
Endometrial polyp	4	5
Ca Cervix	4	5
Vesicular mole	1	1.25
Ectopic pregnancy	2	2.5
Hydrosalpinx	1	1.25
Ovarian torsion	3	3.75
Ovarian lesions	23	28.75
Pelvic abscess	2	2.5
Transvaginal USG diagnosis (N=72)	No. of Cases	% of Cases
Fibroid	36	48.64
Adenomyosis	4	5.4
Endometrial polyp	4	5.4
Ca Cervix	4	5.4
Vesicular mole	1	1.35
Ectopic pregnancy	2	2.7
Ovarian lesions	21	29.2

Table-3: Descriptive analysis of USG diagnosis in the study population

Clinical Diagnosis	No. of Cases	% of Cases
DUB	32	40
Pelvic mass	29	36.25
Cx mass	05	6.25
Mass P/A	04	5
PID	03	3.75
Lt. Ov torsion	03	3.75
Rt. Ov torsion	01	1.25
Ectopic pregnancy	02	2.5
Appendicitis	01	1.25
Total	80	100

Table-1: Descriptive analysis of clinical diagnosis in the study population (N=80)

Type of Fibroid	No. of Cases	% of Cases
Subserosal	04	11.12
Intramural	29	80.55
Submucosal	03	8.33
Total	36	100

Table-4: Descriptive analysis of types of fibroid encountered in the study population (N=36)

Type of Pelvic mass	Sensitivity	Specificity	PPV	NPV	Accuracy
Fibroid	92%	100%	100%	92.59%	96%
Adenomyosis	92.59%	100%	100%	93.10%	96.25%
Endometrial polyp	92.59%	100%	100%	93.10%	96.25%
Ca cervix	92.59%	100%	100%	93.10%	96.25%
Vesicular mole	92.59%	100%	100%	93.10%	96.25%
Ectopic pregnancy	92.59%	100%	100%	93.10%	96.25%
Ovarian lesion	98.45%	100%	98.45%	98.47%	99.2%

Table-5: Comparison of diagnostic accuracy Transabdominal ultrasonography against transvaginal ultrasonography in various pelvic masses.

fibroid and 3 (8.33%) participant ha submucosal fibroid. (Table 4)

In diagnosing fibroids, transabdominal US had a sensitivity and specificity of 92% and 100% respectively. The overall diagnostic accuracy was 96%. In diagnosis adenomyosis, Endometrial polyp, Ca cervix, Vesicular mole, and Ectopic pregnancy transabdominal US had a sensitivity and specificity of 92.59% and 100% respectively. The overall diagnostic accuracy was 93.1%. In diagnosis ovarian lesion, transabdominal US had a sensitivity and specificity of 98.45% and 100% respectively. The overall diagnostic accuracy was 98.47%. (Table 5)

DISCUSSION

Present study showed majority of the cases were uterine fibroid (45%) and Transvaginal Ultrasound in fibroid had a sensitivity of 92.00% and a specificity of 100%. A retrospective study projected results that transvaginal sonography was more accurate over transabdominal sonography in evaluating pelvic masses.⁷

Study conducted by Giuseppe Loverro et al.⁸ results depicted as a test for the detection of uterine cavity abnormalities, TVS in comparison with hysteroscopy had 84.5% sensitivity and 98.7% specificity, 98.0% positive predictive value and 89.2% negative predictive value. Results stated that 4 cases of adenomyosis are detected while 2 cases were wrongly diagnosed as fibroid on Transabdominal scan, which turned out to be adenomyosis of uterus on Transvaginal Scan.

Another research showed TVS was better to diagnose endometrial polyps, submucosal fibroids, nabothian cysts and adenomyosis while TAS seen superior in cases of bulky uterus.⁹

A total of 4 cases of Carcinoma cervix were detected on Transabdominal scan and confirmed by Transvaginal Scan. A study showed Sensitivity of TAS and TVS to diagnose Ca cervix 57.1% and 78.6%, specificity 89.7% and 92.3%, positive predictive value 66.9% and 78.6%, negative predictive value 85.4% and 92.3%, and accuracy 81.1% and 88.7% respectively which concluded uterine mass can be evaluated more accurately by TVS than TAS.¹⁰

In the current study by using IOTA scoring system, Transvaginal Ultrasound in ovarian lesions had a sensitivity of 98.45% and specificity of 100%. Out of 23 cases, 16 cases showed benign ovarian lesions and 7 cases showed malignant ovarian lesions. Similar study conducted by Giovanni Serafini et al.¹¹ stated that transvaginal sonography identified one small previously undetected tumor but was not able to image

the entire extent and it recognized actual uterine origin of an eccentric pelvic mass.

Asim Kurjak et al.¹² found the sensitivity 96.4%, specificity 99.8%, and positive predictive value 98.2% of transvaginal color ultrasound.

In one research adnexal findings highly suspicious for ectopic pregnancy were found in 68% of cases by transabdominal ultrasonography and in 84% by transvaginal ultrasonography.¹³ In current study 2 cases of ruptured ectopic pregnancies were detected.

A study reported that TAS had a limited diagnostic capacity for adenomyosis but also that TVS alone was poor in patients with an enlarged uterus.¹⁴ In present study 2 cases were wrongly diagnosed as fibroid on Transabdominal scan, turned out to be adenomyosis of uterus on Transvaginal Scan. Another study reported TVS as sufficiently accurate tool for diagnosis of adenomyosis in clinically suspected cases, but not in unselected premenopausal women with myomas.¹⁵

Strengths of study: Present study has followed detailed procedure of both the methods used.

Limitations of the study: The sample size was less hence study cannot be generalized.

CONCLUSION

Transabdominal and Transvaginal sonography with a good equipment when appropriately performed by an experienced radiologist, using a proper methodology and standard guidelines has proved to be a very useful highly diagnostic and a reliable method with good sensitivity and specificity. It thus has become an indispensable tool for the diagnosis, management and follow up of all cases with pelvic mass.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 23-06-2019; **Accepted:** 22-07-2019; **Published online:** 14-08-2019