Original Research Article

Comparision between transabdominal and transvaginal sonography in various gynecological disorders

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Abstract

Objectives: To assess the diagnostic accuracy of Transvaginal sonography as compared to transabdominal sonography in various gynecological disorders. **Methodology:** Total number of 100 patients attending OPDs with various complaints were selected by random technique of the study. All the patients have informed consent and thorough clinical examination including general, systemic and pelvic examination was conducted after taking a detailed history then the patients underwent transabdominal sonography and transvaginal sonography followed by one of the procedures like fractional curettage, dilatation and curettage and abdominal hysterectomy (with or without conservation of ovaries) or conservative management with regular follow up. **Results:** Our analysis, showed that transvaginal sonography had high diagnostic accuracy when compared to clinical examination 70% of fibroid, 8% of ovarian cyst, 100% paraovarian cyst, and 66.6% cases of endometrial polyp were missed by clinical examination. 50% of PID were misdiagnosed by clinical examination which were diagnosed as ovarian cyst. There was statistical significant difference of TAS findings with TVS findings of patients ($P< 0.05$). There was statistically highly significant difference of clinical findings with TVS findings of the patients ($P<0.01$). **Conclusion:** The final outcome is that transvaginal ultrasonographic examination is an important non-invasive investigation, can be used as important diagnostic method in various gynecological disorders as it has got a high diagnostic accuracy in small pelvic masses where transabdominal sonography is helpful in evaluating large pelvic masses.

Keywords: Transvaginal sonography; AUB; PID; Ovarian cyst; Carcinoma endometrium; Endometrial polyp; Histopathological examination

Introduction

In the beginning, ultrasound was admired for its non-invasiveness. Since it was introduced in medical imaging, ultrasound has revolutionized the diagnosis of intra-abdominal pathology. Subsequently it was expected that it would improve access to a variety of organs[1].

Transvaginal sonography has encouraged practicing obstetricians and gynaecologists to take sonographic diagnosis more seriously since its introduction.

A transvaginal ultrasound – which can visualize deeper structures and note specific organs like the fallopian tube and the ovary[2] - is frequently used to diagnose abdominal masses, abnormal bleeding, pelvic pain, uterine enlargement, ectopic pregnancyand many other conditions. TVS is another way to detect congenital anomalies, leiomyomas, and evaluate endometrium. It is also an invaluable tool for the care of infertility patients[3].

The aim of the present study is to know the role of Transvaginal sonography as compared to Transabdominal sonography in diagnosing the various gynaecological disorders.

Materials and methods

The present study was conducted at Basaveshwar Teaching & General Hospital, Gulbarga and Sangameshwar Teaching & General Hospital, Gulbarga, affiliated to M.R.Medical College, Gulbarga, between 1st October 2019 to 31st March 2021.

In the study, 100 patients were randomly selected from offices of primary care with complaints of menstrual irregularities with complaints like menorrhagia, polymenorrhea, polymenorrhagia, pain abdomen, mass per abdomen, and infertility.

Informed consent was obtained from all patients, and local ethical approval was obtained. After taking a detailed history, a detailed clinical examination was conducted including general, systemic, and pelvic examinations.

Inclusion Criteria

1. Patients with menstrual irregularities
2. Uterine and adnexal masses
3. Pelvic inflammatory diseases
4. Chronic vaginal discharge
5. Ovarian masses and
6. Infertility problems.

Exclusion Criteria

1. Pregnant women
2. Unmarried women.

After an informed written consent, the patients then underwent transabdominal and transvaginal sonography followed by one of the invasive procedures, fractional curettage, dilatation and curettage and abdominal hysterectomy (with or without conservation of ovaries) or conservative management with regular follow-up.

Transvaginal Sonography

The study was conducted in an office setting. The LOGIQ F6 Ultrasound System was used at Basaveshwar Teaching & General Hospital and Sangameshwar Hospital, Gulbarga, with a transabdominal probe of 5 MHz and transvaginal probe of 7 MHz.

Through the comparison of transabdominal and transvaginal sonography findings with clinical diagnosis, the accuracy of the scanning technique was calculated for the diagnosis of AUB, fibroid, ovarian cyst, endometrial polyps, carcinoma endometrium, and pelvic inflammatory diseases.

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Patient Preparation
In explaining the procedure, as well as pointing out that it is painless and that only a small portion of the probe is inserted, the patients were made aware of why it is necessary.

Position
On an examination table, the patient lay down. She was appropriately covered with a sheet and placed supine position with the full bladder for transabdominal sonography, then the patient is asked to empty the bladder and placed in dorsal position with knees flexed, feet flat on the table, approximately shoulder-distance apart, to maintain her dignity. With a pillow, the head and shoulders were slightly elevated. It was necessary to place a pillow below the pelvis in order to allow the examiner's hand to move freely.
Trendlenberg position was avoided so that the intraperitoneal fluid can gravitate to the posterior cul de sac and may help in outlining the pelvic organs.

Results
Study comprised total of 100 patients and observes that, maximum number of patients each 39 (39.0%) were of the age groups 31-40 and 41-50 years respectively, followed by 18 (18.0%) patients were of the age group of 20-30 year and 4 (4.0%) of patients were of the age group of 51-60 years. The mean age of patients was 38.88 years (Table 1).

Table 1: Distribution of patients according to age

Age in years	Number of patients	Percentage
20-30	18	18.0
31-40	39	39.0
41-50	39	39.0
51-60	4	4.0
Total	100	100.0
Mean	38.88 ± 8.16	-----

In this study majority of patients were multiparous 98 (98.0%) and 5(5.0%) of patients' parity was nulliparous.
Among 33 patients presenting with menorrhagia, clinically 30 patients were diagnosed as AUB-I. 1 patient was fibroid uterus and 2 patients were endometrial polyp. By TAS findings 21 patients were AUB and 5 patients were fibroid uterus, 3 patients were normal study. By TVS findings 13 patients were AUB, 11 patients were fibroid uterus, each 3 patients were endometrial polyp and adenomyosis respectively and each 1 patient was scar haematoma and Ca endometrium.
13 patients presenting with polymenorrhagia, clinically 11 patients were diagnosed as AUB-I/O. 2 patients were fibroid uterus. By TAS findings 3 patients were AUB, 7 patients were fibroid uterus and 2 patients were normal study and 1 patient was bulky cervix. By TVS findings 4 patients were AUB, 8 patients were fibroid uterus and 1 patient was cervical polyp.
Among 51 patients presenting with pain abdomen, clinically 28 patients were diagnosed as PID, 23 patients were ovarian cyst/ cystadenoma. By TAS findings 26 patients were PID(Tuboovarain mass), 24 patients were ovarian cyst, 1 Patient wasNormal study respectively. By TVS findings 25 patients were PID(Tuboovarain mass,) 16 patients were ovarian cyst/ cystadenoma, 10 patients were Para ovarian cyst .
Among the 24 cases of ovarian cyst on TAS findings, On TVS 14 cases were confirmed as ovarian cyst and 10 cases were differentiated as paraovarian cyst.
There was statistically highly significant difference of clinical findings with TVS findings of the patients (P<0.01).
There was statistical significant difference of clinical diagnosis with TAS findings of patients (P<0.05)
There was statistical significant difference of TAS findings with TVS findings of patients (P< 0.05)(Table 2)

Table 2: Comparison between clinical diagnosis, TAS and TVS findings

Variables	Clinical diagnosis	TAS Findings	TVS Findings
	Number	Number	Number
PID	28	26	25
AUB-I	40	25	21
Ovarian cyst/ cystadenoma	23	24	14
Fibroid	06	16	20
Normal study	0	06	0
Tuboovarian mass	0	1	01
Cervical polyp	1	1	02
Endometrial polyp	1	0	03
Adenomyosis	0	0	02
scar haematoma	0	0	1
Paraovarian Cyst	0	0	10
Ca endometrium	0	1	1
Postmenopausal bleeding	1	0	0
$\chi 2$-test value and P-value	clinical v/s TAS	clinical v/s TVS	TAS v/s TVS
	$\chi 2_{yates} = 6.721$ P < 0.05 S	$\chi 2_{yates} = 10.927$ P < 0.01 HS	$\chi 2 = 5.312$ P < 0.05 S

NS= not significant**, S=significant**, **HS=highly significant**, VHS=very highly significant

Variables	TAS	TVS
Ovarian cyst	24	14
Paraovarian Cyst	0	10

One patient with diagnosed with endometrial carcinoma on transvaginal sonoghraphy showed tubular endometrium, loss of sub endometrial hallow with early invasion, an enlarged uterus with a mixed echo pattern or endometrial fluid.

2 patients with Adenomyosis showed heterogeneous circumscribed areas of the myometrium with indistinct margins, harboring anechoic lacunae.

There was no statistical significant difference of mean endometrium of patients between Out of 7 cases with proliferative endometrium in histopathology, when an endometrial thickness of 5-10 mm was taken as the predictor for proliferative endometrium. TVS was 57.1% sensitive by picking up 4 out of 7 cases. The remaining 3 cases had an endometrial thickness of >10 mm.

Out of 2 cases of secretory endometrium, transvaginal sonography had 100% sensitivity in predicting it, when thickness of 10-12 mm was taken as the predictor of secretory endometrium. Thus, in the present study, the endometrial thickness ranged from 10-15 mm in secretory endometrium. Taking this as the predictor of secretory pattern, TVS would be 100% accurate in predicting secretory endometrium.

Out of 5 cases of endometrial hyperplasia on histopathology, all 5 cases were picked by transvaginal sonography, when the thickness of >12 mm was taken as the predictor of hyperplasia, the sensitivity being 100% and specificity of 100%(Table 4).

Table 3: Distribution of patients according to Endometrium thickness

Age in years	TAS findings		TVS findings	
	NO.	%	No.	%
≤10	4	28.6	4	28.6
11-15	5	35.7	5	35.7
>=15	5	35.7	5	35.7
Total	14	100.0	14	100.0
Mean ± SD	15.21 ± 6.34		16.08 ± 5.32	
$\chi 2$-test value and P-value	$\chi 2 = 1.173$ P > 0.05 NS			

NS= not significant**, S=significant**, **HS=highly significant**, VHS=very highly significant

Table 4: Distribution of patients with endometrial thickness and histopathology findings

Endometrial Thickness		Histopathology findings	
≤10	4	Proliferative	7
11-15	5	Secretory	2
>=15	5	Endometrial Hyperplasia	5

Conclusion

Transvaginal sonography gives clear picture of individual pelvic organs and hence morphology can be studied in minute details. This is both due to closed proximity of transvaginal sonography probe to the pelvic organs imaged, and improved resolution of high frequency and low acoustic pulse transducer.

In case of AUB, the main objective is to correlate the endometrial thickness with histopathology reports of the endometrial tissue. The combined evaluation of endometrial thickness, morphology and endometrial border enhances the diagnostic accuracy of transvaginal sonography.

Thus is helpful in detecting the endometrial pathology in post-menopausal and pre-menopausal women, which helps in decision making regarding the diagnostic and therapeutic management.

Small fibroids are clearly visualized on transvaginal sonography, which were missed on clinical examination. The exact size, site, number, central necrosis and calcifications are well delineated. Transvaginal sonography is highly sensitive in delineating tubovarian mass but in case of large tubovarian mass, the extent of mass and normal ovarian portion of the mass are not clearly visualized.

Transvaginal sonography is helpful in preoperative characterization of ovarian masses. Thus unnecessary laparotomy can be avoided in functional cysts.

Transvaginal sonography helps in differentiating adnexal mass and uterine mass and is having very low sensitivity in cases of upper genital tract infection and acute PID. Clinical diagnosis is better than transvaginal sonography.

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