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ORIGINAL ARTICLE

TO COMPARE THE RESULTS OF TVS AND SIS WITH HYSTEROSCOPY AND HISTOPATHOLOGICAL EXAMINATION IN PERIMENOPAUSAL & POSTMENOPAUSAL BLEEDING

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ABSTRACT: AIMS AND OBJECTIVES: To compare the results of TVS and SIS with hysteroscopy and histopathological findings. **MATERIAL AND METHOD:** This prospective study was conducted in patients attending the outpatient clinic with perimenopausal & postmenopausal bleeding. They all were subjected to transabdominal ultrasound to localise the pathology as the screening procedure. Patients with endometrial pathology underwent endometrial biopsy after TVS, Saline Infusion Sonohysterography (SIS) & hysteroscopy. Endometrial tissue was sent for histopathological examination. **RESULTS:** Sensitivity and specificity of TAS 52.3% & 63.2% while that of TVS is 73.9% &73.7% respectively. Positive Predictive Value and Negative Predictive Value of TVS were also found to be higher than that of TAS and were 77.3% &70% and 63.7% & 53.2% respectively. On comparison of statistical values of TVS with that of hysteroscopy taking histopathology as gold standard, the sensitivity and specificity of TVS were 73.9% and 73.7%, respectively as compared to sensitivity and specificity of hysteroscopy which were 78.3% and 84.7% respectively. The positive predictive value of TVS was 77.3% as compared to 85.4% for hysteroscopy. The sensitivity and specificity of SIS were 77.9% and 83.5%, respectively as compared to sensitivity and specificity of hysteroscopy which were 78.3% and 84.2% respectively. The diagnostic accuracy of SIS was (79.1%) as compared to diagnostic accuracy of hysteroscopy (81 %). Five mm endometrial thickness was taken as a cut - off below which the endometrium was considered normal atrophic and if it is equal or more than 5 mm, endometrial lesion is expected. **CONCLUSION:** Among TVS, SIS & hysteroscopy it was seen that hysteroscopy has the highest diagnostic accuracy for endometrial pathology. For endometrial pathology the TVS could be used as a first choice diagnostic screening test in the investigation of women with perimenopausal and postmenopausal bleeding. TVS can select those cases in which the likelihood of endometrial pathology is high. SIS has advantages over office hysteroscopy that it is better tolerated by patients and cheaper, moreover, SIS is easy to learn and can be quickly performed with minimal extra equipment as part of an ultrasound examination.

KEYWORDS: TVS, saline infusion sonography, hysteroscopy, histopathology, perimenopausal & postmenopausal bleeding.

INTRODUCTION: AIMS AND OBJECTIVES: To compare result of TVS and SIS with that of hysteroscopy and histopathology in the diagnosis of endometrial lesion.

MATERIAL & METHODS: This prospective study was conducted in patients attending the outpatient clinic with perimenopausal & postmenopausal bleeding. Their age, parity, socio-economic status, symptoms were recorded and they all were subjected to transabdominal ultrasound to localise the

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pathology as the screening procedure. Patients with endometrial pathology underwent endometrial biopsy after TVS, Saline Infusion Sonohysterography (SIS) & hysteroscopy and endometrial tissue was sent for histopathological examination.

A total of 280 cases with the age between 35 to 85 years, with perimenopausal & postmenopausal bleeding were included in this study. Sixty patients were perimenopausal and 220 patients were postmenopausal. Detailed history of the patient was taken**.** Inspection, speculum examination and bimanual pelvic examination were done.

All patients underwent transabdominal ultrasonography. In 84 patients TAS revealed pathology, they were advised further evaluation by TVS, SIS, hysteroscopy and biopsy. 22 patients refused for further investigation while 20 patients did not come for follow up after preliminary procedure, so they were excluded from the study. Females with diagnosed genital tract pathologies, with known bleeding disorders and on hormone replacement therapy were excluded from study. Remaining 42 patients who were included in the study, all were postmenopausal and these patients underwent TVS, SIS, hysteroscopy and biopsy.

All the patients were subjected to TVS initially with empty bladder and in the post menstrual phase after obtaining the written consent. TVS was done using 5 MHZ transvaginal probe, endometrial thickness (ET), uterine pathology, adnexal and any other pelvic pathology was noted. After TVS, SIS was performed in these patients.

A speculum is inserted to visualize the cervix. A No. 8 foley's catheter is inserted into the cervix usually with sponge forceps. A balloon of catheter was used to prevent retrograde leakage of saline into the vagina. Balloon is to be placed as close to the internal as possible. Balloon is inflated with 2-3 cc of normal saline to prevent air within the balloon from causing a shadow that would make visualization of uterine pathology impossible. A 5F pediatric feeding tube or insemination catheter can also be used. The uterine cavity was then filled with normal saline under continuous sonographic control. The uterus is scanned systematically in sagittal and coronol planes to delineate the endometrial cavity. In the normal uterus the endometrium appears symmetric, surrounding the anechoic, saline distended endometrial cavity. An intracavitary polyp is seen surrounded by anechoic fluid with the point of attachment and thickness of the stalk clearly demonstrated. In women with abnormal bleeding focal areas of endometrial thickening can be identified. SIS allows differentiation of intracavitary, endometrial and submucosal abnormalities without the use of ionizing radiation or contrast agents. After SIS patients were scheduled for hysteroscopy.

Patient was asked to void before the procedure, then put in dorsal lithotomy position, cleaned with non-foaming antiseptic and draped. Bimanual pelvic examination was done. Anterior lip of the cervix was grasped with valsellum, after exposing by SIMS speculum put in posterior vagina and retracting downward. Uterine sounding was done to know the utero-cervical length. Hysteroscope was inserted into the external os. Then advance was stopped for several seconds so that distention medium dilates the endocervical canal. Finally internal os was negotiated to reach the cavity under direct vision. Cavity was explored in systematic manner examining the anterior posterior, lateral walls, fundus and tubal Ostia all the while rotating the instrument in its axis. The examination lasted from 5-15 minutes.

After hysteroscopy biopsy was taken and tissue sent for histopathological examination.

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RESULT: In our study histopathology showed that majority of cases 19 (45.2%) had endometrial atrophy. Endometrial hyperplasia was diagnosed in 8 cases (19%), a polyp was found in 11 cases (26.2%), endometritis was found in 2 cases (4.8%) and endometrial carcinoma was the histopathological report of 2 cases (4.8%). (Table/ figure I).

The sensitivity and specificity of TVS were 73.9% and 73.7%, respectively as compared to sensitivity and specificity of hysteroscopy which were 78.3% and 84.7% respectively. The positive predictive value of TVS was 77.3% as compared to 85.4% for hysteroscopy. The diagnostic accuracy of TVS is 73.8% while that of hysteroscopy is 81 %. (Table/ figure II).

The sensitivity and specificity of SIS were 77.9% and 83.5%, respectively as compared to sensitivity and specificity of hysteroscopy which were 78.3% and 84.2% respectively. The positive predictive value of SIS was 84.2% as compared to 85.7% for hysteroscopy. The diagnostic accuracy of SIS was (79.1%) as compared to diagnostic accuracy of hysteroscopy.(81 %).

TVS diagnosed endometrial hyperplasia in 7 out of the 8 cases i.e (87.5%) cases, while the other case was diagnosed as normal atrophic endometrium. A polyp was diagnosed in 9 cases of the 11, while the other 2 cases were diagnosed as normal atrophic endometrium. The 2 cases of endometritis were diagnosed by TVS as hyperplasia. From the 2 cases of endometrial carcinoma one case was correctly diagnosed by TVS while the other was diagnosed as a polyp due to absence of invasion. Submucous myoma were diagnosed by TVS in 1 case while hysteroscopy diagnosed submucous myoma in 2 cases. Hysteroscopy had diagnosed 18 cases from the 23 cases that had been diagnosed by histopathology (sensitivity 78.3%). Hyperplasia was diagnosed in 6 of the 8 cases, while the other 2 cases were diagnosed as normal atrophic endometrium and endometritis. A polyp was diagnosed in 10 of the 11 cases while the other case was diagnosed as polypoidal hyperplasia. One of the 2 cases of endometritis was diagnosed correctly while the other was diagnosed as hyperplasia. One of the 2 cases of endometrial carcinoma was diagnosed correctly by hysteroscopy while the other case was diagnosed as polypoidal hyperplasia. (Table/ figure III).

SIS diagnosed hyperplasia in 7 of the 8 cases, while the other case was diagnosed as normal atrophic endometrium. A polyp was diagnosed in 11 cases of the 11 (Figure 4 & 5). The 2 cases of endometritis were diagnosed by SIS as hyperplasia. From the 2 cases of endometrial carcinoma 1 case was diagnosed correctly while other was diagnosed as polyp. Myoma was detected in 2 cases which was verified by hysteroscopy.

Five mm endometrial thickness was taken as a cut- off below which the endometrium was considered normal atrophic and if it is equal or more than 5 mm, endometrial lesion is expected. (TABLE VII)

DISCUSSION: Peri and post-menopausal bleeding is an important and common problem encountered in gynecology practice. Endometrial and uterine abnormalities such as leiomyoma, polyps, hyperplasia and endometrial carcinoma are common causes to be evaluated with invasive and non-invasive techniques. Though TVS is the first imaging modality of choice for the evaluation, it has limitations in detecting small lesions, location of myoma and in differentiating diffuse and focal lesion. Hysteroscopy has been considered as the gold standard but it is expensive, invasive and does not contribute in the evaluation of myometrial or ovarian pathology. SIS is found to be more accurate than TVS to visualize the endometrial cavity and it is a better alternative to hysteroscopy.

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Our study showed that SIS as compared to TVS has got very high diagnostic accuracy for focal endometrial pathology i:e endometrial polyp, submucous myoma & endometrial hyperplasia**.**

Goldstein SR et al also concluded that non-directed office biopsy without imaging would have potentially missed the diagnosis of focal lesions such as polyps, submucous myomas, and focal hyperplasia in upto 18% patients.[1]

Hysteroscopy had diagnosed 18 cases from the 23 lesions that had been diagnosed by histopathology (sensitivity 78.3%). Thus the specificity of hysteroscopy was 84.2%, its predictive value as a positive test was 85.7%, its predictive value as a negative test was 76.2% and its overall efficacy was 81%. Results of Hysteroscopy and SIS are comparable in diagnosis of focal lesions.

Epstein et al has reported an almost perfect agreement (96%) between saline contrast sonohysterography and hysteroscopy in the diagnosis of focally growing lesions.[2] Saline contrast sonohysterography and hysteroscopy both had a sensitivity of approximately 80% with regard to diagnosing endometrial polyps (false-positive rates of 24% and 6%, respectively), whereas conventional ultrasound missed half of the polyps (sensitivity, 49%; false-positive rate, 19%). Kamel et al (2000) in a study of 106 patients with abnormal uterine bleeding has achieved 93.3% sensitivity, 94.6% positive predictive value and 93.3% diagnostic accuracy in the detection of endometrial polyps by SIS.[3] Soares et al has reported 100% sensitivity, 100% positive predictive value and 100% diagnostic accuracy for polypoid lesions, including endometrial polyps, fibroids and endometrial hyperplasia.[4]

In our study, comparison of statistical values of TVS with that of hysteroscopy taking histopathology as gold standard, the sensitivity and specificity of TVS were 73.9% and 73.7%, respectively as compared to sensitivity and specificity of hysteroscopy which were 78.3% and 84.7% respectively. The positive predictive value of TVS was 77.3% as compared to 85.4% for hysteroscopy. The diagnostic accuracy of TVS (73.8%) while that of hysteroscopy is 81%.

Our results although less but near to that reported by Cacciatore et al.[5] For TVS the sensitivity and specificity versus endometrial pathology were 73.9% and 73.7% respectively while in Cacciatore et al. study they were 73.9% and 95.7% for hysteroscopy. The sensitivity and specificity versus endometrial pathology were 78.3% and 84.2% respectively while in Cacciatore et al. study they were 86.9% and 91.7%.

On comparison of statistical values of SIS with that of hysteroscopy, Hysteroscopy was more sensitive and specific as compared to SIS alone. The sensitivity and specificity of SIS were 77.9% and 83.5%, respectively as compared to sensitivity and specificity of hysteroscopy which were 78.3% and 84.2% respectively. The positive predictive value of SIS was 84.2% as compared to 85.7% for hysteroscopy. The diagnostic accuracy of SIS was (79.1%) as compared to diagnostic accuracy of hysteroscopy (81%). Our study is in accordance to study done by Kelekci S, Kaya E, AlanM. (2005) where he reported that hysteroscopy had 81.3% sensitivity and 99% specificity.[6] The results also corresponded to results of Grimbizis GF et al.[7]

The endometrial thickness was significantly lower ($p < 0.001$) among patients with normal atrophic endometrium than in other lesions .Five millimeter endometrial thickness was taken as a cut – off, below which the endometrium was considered normal atrophic and if it is equal or more than 5 mm, endometrial lesion is expected. Similar results were found in studies of Smith Bindman R et al that when an endometrial thickness threshold of 4 or 5 mm is used, the sensitivity for detecting endometrial carcinoma approaches 95%.[8] Grandberg et al., Nasri et al., Andolf et al. also reported

that taking 5 mm endometrial thickness as a cut-off level for detection of endometrial pathology in postmenopausal women was of good practical application with an overall efficacy 81%.[9,10,11]

CONCLUSION: Among TVS, SIS & hysteroscopy it was seen that hysteroscopy has the highest diagnostic accuracy for endometrial pathology. For endometrial pathology the TVS could be used as a first choice diagnostic screening test in the investigation of women with perimenopausal and postmenopausal bleeding. TVS can select those cases in which the likelihood of endometrial pathology is high i.e. when the endometrial thickness is 5 mm or more. SIS is comparable to hysteroscopy as a method of diagnosing focal lesions in the uterine cavity in women with abnormal uterine bleeding. SIS has advantages over hysteroscopy that it is better tolerated by patients and cheaper, moreover, SIS is easy to learn and can be quickly performed with minimal extra equipment as part of an ultrasound examination. It is clinically important to be able to reliably discriminate between benign and malignant lesions in the uterine cavity, because this would allow individual and optimized management of bleeding.

Thus, it would be worthwhile to try to improve the ultrasound diagnosis of endometrial abnormalities. Sonographic criteria of polyps and uterine malignancy need to be redefined, because polyps and cancer were often confused with each other at SIS. Adding Doppler ultrasound, to SIS might improve the diagnostic accuracy. Our results have substantiated that SIS is a better tool as compared to TVS for the assessment of endometrial Intra cavity lesions. By providing accurate differentiation between focal and diffuse endometrial lesions, it can help in decision making regarding selection of cases for hysteroscopy and directed biopsy. Endometrial biopsy integrated with hysteroscopy should be used for achieving final diagnosis where require in endometrial pathology as it has the advantage of permitting a targeted biopsy in the event of localized lesions, reducing the possibility of false negatives. In addition, it permits proper classification of the extent and degree of hyperplasia.

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Histopathology	Cases	Percentage
Endometrial Atrophy	19	45.2
Endometrial Hyperplasia	8	19
Endometrial Polyp	11	26
Endometritis	2	4.8
Endometrial Carcinoma	2	4.8
Total	**42**	**100**

TABLE I: Distribution of patients with endometrial cause acccording to histopathological diagnosis in 42 cases

FIGURE II: Comparision of statistical values of tvs and hysteroscopy in patients with endometrial pathology.

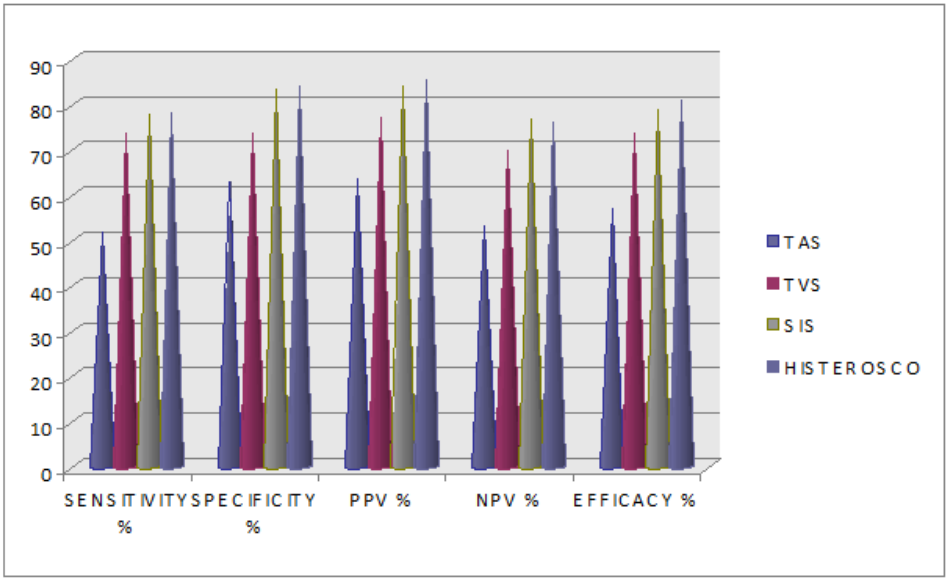

Figure II

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FIGURE III: Findings of 42 patients with endometrial pathology on tas, tvs, sis, hysteroscopy & histopathology.

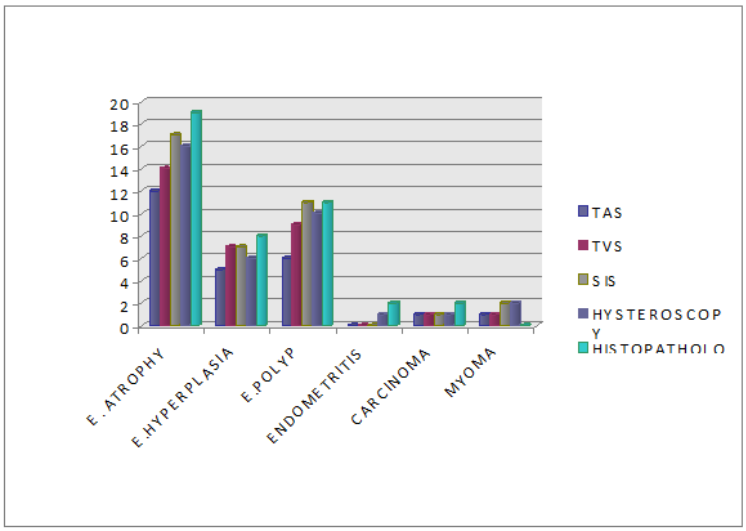

Figure II

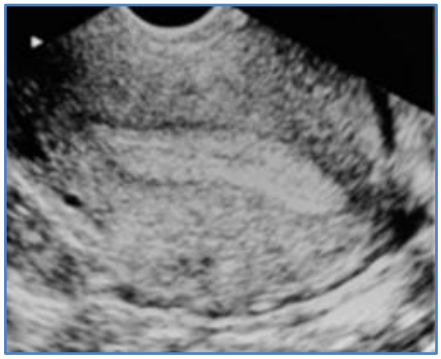

Fig. IV: Longitudinal scan of TVS showing a homogenous hyperechoic thick endometrium without any focal lesion

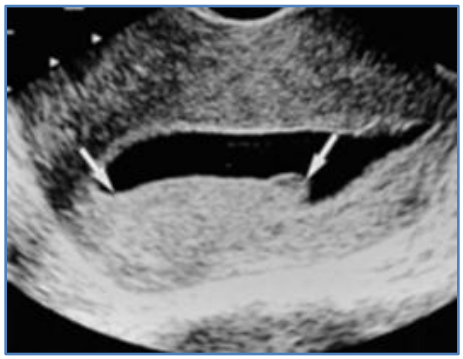

Fig. V: Longitudinal scan of SIS showing elongated endometrial polyp

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Hysteroscopy	TVS Endometrial thickness mean + s.d. (range)
Atrophy	3.8 ± 1.8 (2 - 6)
Hyperplasia	12.9 + 7.2 (4 - 26)
Endometritis	12.5 ± 0.7 (12.13)
Polyp	15.3± 7.9 (2.29)
Carcinoma	21.1 + 9.8 (12 - 30)

TABLE VI: Endometrial thickness measured by tvs in relation to histopathological findings

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