



SALINE INFUSION SONOHYSTEROGRAPHY CAN BE AN EFFICIENT MODALITY FOR EVALUATION OF POSTMENOPAUSAL BLEEDING IN PLACE OF HYSTEROSCOPY

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ABSTRACT

Postmenopausal bleeding (PMB) requires prompt exclusion of malignancy for reduction of morbidity and mortality risks. A screening method with high specificity and sensitivity would prevent invasive procedure and aid in accuracy. The objective of present study was to evaluate the role of Transvaginal ultrasound (TVS), Saline Infusion Sonohysterography (SIS) and Hysteroscopy (HS) in diagnosis of PMB. A total of 37 women with PMB attending gynecology OPD in Kasturba Hospital were enrolled and subjected to TVS, SIS and HS. Results were compared with histopathology as gold standard. The most frequent cause of PMB was endometrial polyp (29.7%) followed by endometrial hyperplasia (24.3%), endometrial atrophy (21.6%), submucous myoma (13.5%) and endometrial carcinoma (10.8%). Overall sensitivity, specificity, Positive predictive value (PPV) and Negative predictive value (NPV) of TVS was found to be 78.6%, 92.6%, 73.7% and 92.3% respectively but that of SIS and hysteroscopy were 82.4%, 94.3%, 74.6%, 94.1% and 82.7%, 96.9%, 81.2%, 94.2% almost at par respectively. TVS extended to SIS whenever required is recommended to be the preliminary investigation of choice in PMB.

KEYWORDS : TVS, SIS, Hysteroscopy, Postmenopausal bleeding

INTRODUCTION

Menopause is a natural physiologic mechanism in a women's body when she stops menstruating. The average age of menopause in Asian women is 46years¹. Postmenopausal bleeding (PMB) is considered as an episode of bleeding ≥ 12 months after the last regular menstrual period². PMB rings alarm of an ominous and a serious nature since genital pathologies constitutes 73% of all gynecological disorders in older women at this age with PMB. It affects 1 in 10 postmenopausal females older than 55yrs¹.

The most common cause of PMB is atrophic endometritis/vaginitis (30%)^{3,4} followed by exogenous estrogens use (15-25%)⁹, endometrial polyp (10%), endometrial hyperplasia (5%) but it is the endometrial cancer (15%) which requires prompt exclusion. The life time risk of developing endometrial carcinoma is 1.1% and can have good prognosis if diagnosed early⁵.

Risk factors includes life style choices e.g smoking, caffeine, obesity³, alcohol intake, family history of genital or breast malignancies, exogenous estrogen (HRT, TAMOXIFEN) chronic anovulation (PCOS), familial (Lynch syndrome type-1), patient on chemotherapy especially on alkylating agents, nulliparity and medical disorders like diabetes and hypertension³.

Dilatation and curettage under anesthesia has been the standard diagnostic tool in abnormal uterine bleeding but is poor test in benign conditions besides being invasive⁶.

Transvaginal ultrasound (TVS) is an efficient and acceptable non invasive method for early detection of endometrial pathology in Postmenopausal women⁷. The thickened endometrium post menopause is the most significant ultrasonographical findings implicating some pathology. Hence, If the endometrium is ≤ 4 mm as measured by TVS, endometrial abnormality can be excluded with a high probability⁸.

Saline Infusion Sonohysterography (SIS), a noninvasive and well tolerated modality is being considered as a safe

alternative to hysteroscopy in the extended evaluation of PMB. SIS has been preferred over traditional TVS as it provides excellent visualization of endometrial cavity and easily differentiate between polyps and submucous myoma due to its added advantage of saline being used as distension media and negative contrast⁹.

Hysteroscopy is considered as well tolerated, accurate and sensitive procedure in investigation of PMB¹⁰ which allows direct visualization and biopsy of diffuse or focal abnormalities of endometrium. It is however, a rather invasive method and carries a false negative rate of 3%¹¹. It also requires expertise and well-equipped facility along with anesthetist support.

The authors aimed to evaluate the diagnostic accuracy of TVS with and without SIS compared to hysteroscopy in women having PMB.

MATERIALS AND METHODS

In this prospective, cross sectional study conducted in a tertiary care Hospital between Jan 2018 to December 2018, 37 women attending the gynecology OPD, presenting with PMB were enrolled. Women with Acute PID, Cervical, vaginal and ovarian malignancies, Women on HRT/ Tamoxifen, with known Coagulopathies and with known contraindication to anesthesia were exempted from the study.

After a detailed history (including personal and menstrual history), examination, necessary investigations and informed consent, all women underwent TVS with a transvaginal transducer of 7.5MHz. The endometrium was assessed for thickness, regularity, echogenicity, homogeneity and presence of any mass (size, texture, multiplicity, regularity of margins). After TVS patients were subjected to SIS with the help of a 8F Foley's catheter with guided wire. The findings of SIS were noted and compared with that of TVS. Within a period of 2-4 weeks, same patients underwent hysteroscopy under suitable anesthesia. The endocervical canal and uterine cavity were inspected for any endometrial abnormalities (atrophy, thickening, focal abnormalities) and focal lesions. Findings were noted and endometrial biopsy

was taken from suspicious areas and sent for histopathology. PAP Smears of all were done to exclude cervical pathology.

The data of all the three procedures viz. TVS, SIS, HS along with results was coded and analyzed with SPSS. The histopathological examination of directed biopsy was considered as the gold standard. Appropriate statistical analysis of the data was done in terms of : Sensitivity, Specificity, PPV and NPV.

RESULTS

The age, menarche, Menopause, parity and duration of menopause are shown in table 1.

The mean age at presentation in this study was about 55 years with mean duration of menopause being 6.97±6.44 years. Large number of patients (73%) had symptoms within first 10 years of attaining menopause

TABLE 1: clinical characteristics of study population (N=37)

	Range	Mean ± S.D
AGE	45-77 years	54.95 ± 7.36 years
MENARCHE	8-16 years	13.03 ± 1.97 years
MENOPAUSE	43-55 years	48.0 ± 2.78 years
DURATION OF MENOPAUSE	1-24 years	6.97 ± 6.44 years
PARITY	0-6	3.62 ± 1.47

Apart from bleeding per-vaginum, Pelvic pain was the second most common symptom followed by dyspareunia and post coital bleeding. Mean duration of symptoms noted in study population was 5.57± 1.53 months. All of the patients reported within a year of onset of symptoms. Maximum patients (67.56%) had no history of any associated medical conditions. The most frequent cause of PMB found was endometrial polyp (29.7%) followed by endometrial hyperplasia (24.3%), endometrial atrophy (21.6%), submucous myoma (13.5%) and endometrial carcinoma (10.8%). The table 2 shows the diagnostic accuracy of three methods performed.

TABLE 2: Diagnostic accuracy of TVS, SIS and hysteroscopy among different pathologies in women with postmenopausal bleeding (N=37)

Pathological diagnosis	Sensitivity	Specificity	PPV	NPV
Over all				
TVS	78.6	92.6	73.7	92.3
SIS	82.4	94.3	74.6	94.1
HS	82.7	96.9	81.2	94.2
Endometrial atrophy				
TVS	100	100	100	100
SIS	100	100	100	100
HS	100	100	100	100
Endometrial hyperplasia				
TVS	77.8	100	100	93.4
SIS	77.8	100	100	93.3
HS	88.9	100	100	96.6
Endometrial polyp				
TVS	72.7	88.5	72.7	83.8
SIS	81.8	92.3	81.8	92.3
HS	83.3	96	90.9	92.3
Submucous myoma				
TVS	80	96.7	80	96.7
SIS	80	93.8	66.7	96.8
HS	66.7	96.8	80	93.8
Endometrial carcinoma				
TVS	75	90.9	50	89.2
SIS	75	93.9	60	96.9
HS	75	96.7	75	96.9

Overall sensitivity, specificity, PPV and NPV of TVS was found to be 78.6%, 92.6%, 73.7% and 92.3% respectively while that of SIS and hysteroscopy were 82.4%, 94.3%, 74.6%, 94.1 and

82.7%, 96.9%, 81.2%, 94.2% respectively for various pathologies noted.

DISCUSSION

Postmenopausal bleeding is considered to be caused by endometrial neoplasia until proven otherwise³. Since 90% of women with endometrial carcinoma present with vaginal bleeding, accepted practice includes a detailed evaluation of women with PMB¹². Even a single episode of PMB must be evaluated. Although PMB is most commonly due to benign lesions, such as endometrial atrophy, polyps and fibroids, it is essential to exclude endometrial carcinoma.

Most common pathology for postmenopausal bleeding in this study was found to be endometrial polyp (29.7%), followed by endometrial hyperplasia (24.3%), endometrial atrophy (21.6%), submucous myoma (13.5%) and endometrial carcinoma (10.8%) which was similar to the studies conducted by Bronz et al¹³ and B. Bingol et al¹⁴.

The comparison between the overall diagnostic accuracy of TVS, SIS and Hysteroscopy clearly indicates that, hysteroscopy had a higher diagnostic value (82.7% sensitivity, 96.9% specificity, 81.2% PPV and 92.3% NPV) compared to TVS (78.6% sensitivity, 92.6% specificity, 73.7% PPV, 92.3% NPV) but it was almost comparable to SIS (82.4% sensitivity, 94.3% specificity, 74.6% PPV and 94.1% NPV)

All the three modalities were able to diagnose all cases of endometrial atrophy with 100% sensitivity and specificity which was comparable to study conducted by B. Bingol¹⁴ et al (2010).

Hysteroscopy yielded a higher sensitivity (88.9 vs 77.8) in diagnosing endometrial hyperplasia than both TVS and SIS, whereas Specificity, PPV, NPV of the three modalities were comparable.

The sensitivity and PPV of TVS in diagnosing endometrial polyp were lower than both SIS (Fig.1) and Hysteroscopy due to masking of small polyps by a very hyper-echo-dense endometrium. Goldstein et al¹⁵ also stated the same fact that small structural abnormalities can be easily missed and it is not always possible to differentiate between endometrial and myometrial abnormalities on TVS



Figure 1: Endometrial polyp on saline infusion sonohysteroGRAPHY

Among submucous myoma patients, hysteroscopy had comparatively lesser sensitivity of 66.7% as compared to SIS (80%). This may be because of the fact that SIS is able to better delineate the endometrium-myometrium interface which was in conformance to study conducted by Banu Bingol et al¹⁴.

The sensitivity of all the three modalities in diagnosing endometrial carcinoma was 75% while PPV of hysteroscopy was clearly better than TVS and SIS. SIS couldn't reliably discriminate between benign and malignant focal lesions which is revealed by the fact that 2 cases of hyperplasia were actually carcinoma in the study.

With respect to gold standard histopathological diagnosis, the diagnostic accuracy of TVS in the detection of uterine abnormalities in postmenopausal women was found to be limited. TVS has been reported to fail in differentiating between submucous myoma, endometrial polyp and proliferative endometrium.

TVS extended to SIS, as a procedure was easily tolerated by patients and proved its diagnostic value similar to hysteroscopy in the detection of endometrial abnormalities among postmenopausal bleeding patients. Hysteroscopy as stated in the literature, provided most accurate description of the endometrial cavity with biopsy as gold standard. SIS with its 82.4% sensitivity, 94.3% specificity, 74.6% PPV and 94.1% NPV emerged as an excellent tool, which was comparable to hysteroscopy.

CONCLUSION

SIS can be performed safely and easily as an outpatient procedure. It has a comparable diagnostic accuracy as hysteroscopy with an added advantage of its cost effectiveness and non invasive nature. Hence SIS can be considered as a diagnostic tool in PMB, especially in remote areas where expertise for hysteroscopy, infrastructure, O.T are not available and when patient has severe co-morbidities making them unfit for anaesthesia which is required for hysteroscopy. SIS is also helpful if there is a discrepancy between the findings on the TVS and the endometrial biopsy.

TVS being an easy, safe, cost effective and a non invasive procedure with high negative predictive value is considered as an appropriate first line investigation for evaluating all cases of postmenopausal bleeding along with endometrial pipelling (EP). Whenever any abnormality is suspected on TVS/EP, either SIS or Hysteroscopy can be considered for further evaluation.

Hysteroscopy can be considered as both diagnostic and therapeutic modality, with a superior diagnostic accuracy than SIS as it allows direct visualization of pathology and provision to take a targeted biopsy. However, it is invasive, highly specialized and operator dependent procedure requiring operation theatre, services of anesthetist etc. Thus, it requires a specialized center and admission facility. Hence, TVS extendable into SIS as an outpatient investigative procedure is recommended to be the preliminary investigation of choice in PMB.

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