

Evaluation of Role of Transvaginal Sonography as Diagnostic Aid in Comparison with Hysteroscopy in Management of Perimenopausal AUB

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Abstract

Background: Hysteroscopic guided biopsy is the gold standard for diagnosing endometrial pathologies. It is an invasive procedure and its use can be restricted by using imaging modalities like TVS. TVS is a first line screening procedure which has very high sensitivity in detecting endometrial pathologies.

Aim and Objective: To compare the hysteroscopy and transvaginal ultrasonography finding with the histopathological report of specimen of endometrium obtained by hysteroscopic guided biopsies.

To evaluate the accuracy of hysteroscopy compared to transvaginal sonography in diagnosing the etiology of abnormal uterine bleeding.

Methodology: Study design: A prospective observational comparative study evaluating the role of TVS as an outpatient procedure in screening for endometrial pathologies of perimenopausal women with AUB. 100 perimenopausal women with clinical diagnosis of abnormal uterine bleeding were selected from the gynaecology OPD of GTVMMCH, Thiruvannamalai between July 2016 and June 2017. They were subjected to Transvaginal ultrasonography as an OP procedure followed by hysteroscopy and hysteroscopic directed biopsy. The efficacy of TVS was determined by correlating the histopathological results obtained from it and the hysteroscopic directed biopsy.

Results: The histopathology of the endometrium obtained using Hysteroscopic guided biopsy were compared with TVS and Hysteroscopy.

Conclusion: Although TVU represents a practical approach for the initial evaluation of uterine pathologies, a hysteroscopic examination would be necessary in most of the suspicious cases. Hysteroscopy seems to offer better diagnostic value for uterine pathologies in general, and uterine polyps in particular and transvaginal sonography is an excellent screening modality and helps to identify cases who mandate hysteroscopy.

Keywords: TVS, Hysteroscopy, Endometrial pathology, Biopsy.

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I. Introduction

AUB is responsible for as many as one-third of all out patient gynaecological visits and this proportion rises to 69% in perimenopausal group^{1,2}. One-third of patients attending the gynaecological outpatient and 70% of women in the perimenopausal and 10-12% in postmenopausal age group present with AUB³. Setzler & colleagues demonstrated that 18% of perimenopausal women had menorrhagia and/or metrorrhagia and one fifth of these were due to premalignant/malignant disease. Abnormal uterine bleeding can occur due to structural and non-structural causes³. Although around 80% of cases are attributed to anovulatory bleeding, a proportion of cases are because of malignant and premalignant condition, hence a meticulous and systematic screening for the pathology is a must. Continuous evaluation of various non-invasive modalities of investigation procedures for perimenopausal bleeding is being undertaken.

Transvaginal sonography is attributed to Kratochwil in 1969, TVS provides valuable information in the evaluation of uterus, adnexal mass, inflammatory processes and neoplasm particularly in screening ovarian and uterine cancer. TVS is relatively painless, non-invasive, safe and cost effective as an investigatory modality. It is reliable to assess endometrial thickness, uterine cavity pathology, uterine and adnexal pathology, inflammatory process and neoplasm.

Aim of study

To evaluate the accuracy of hysteroscopy compared to TVS in diagnosing the etiology of AUB. To compare the hysteroscopy and TVS findings with histopathological specimen of endometrium obtained by hysteroscopic guided biopsy. This prospective study was conducted in Government Thiruvannamalai Medical College and Hospital, Thiruvannamalai on 100 patients attending Gynecology OP randomly chosen between April 2016 to March 2017 in the perimenopausal woman with Abnormal Uterine bleeding.

Inclusion criteria

Women aged >40 years, with Uterine size <12 weeks

Exclusion criteria

Pregnancy, unmarried women, PID,

Women <40 years, profuse bleeding pv

Uterine size >12 weeks.

Women on anticoagulant or with bleeding disorder.

Procedure: Detailed history taking was done. LMP noted. Clinical examination and investigations were done and anaesthetic fitness obtained.

Transvaginal ultrasonography was done noting the endometrial thickness, uterine size, adnexal pathology. Ultrasonographic examination findings were considered normal if a hyperechoic line was observed in the middle of the uterus along with a homogeneous endometrial lining and with a distinct margin with the myometrium. In premenopausal patients, normal limits of anteroposterior diameter of the endometrium was defined as 4-8 mm in proliferative phase, 8-14 mm in the secretory phase and 6-10 mm in the periovulatory phase. An increase above these limits or presence of heterogeneous echogenicity was considered abnormal. Abnormalities were defined as follows: endometrial polyp, uterine myoma, atrophy, and placental residual material. In addition, a non-specific increase in endometrial echogenicity or presence of fluid in the endometrial cavity is classified as non-specific abnormal finding. In postmenopausal patients, a normal endometrium was defined as having a double-wall thickness <5 mm consisting of a thin basal layer. After completion of TVS the same individuals were then subjected to hysteroscopy under short general anaesthesia. Hysteroscopic appearances were categorized as follows: normal, endometrial polyp, endometritis, atrophy, uterine myoma, malignancy, hyperplasia, residual placental material or hyperplasia. In addition, findings of proliferation, hypertrophy and synechia were categorized as non-specific findings.

Table-I = Correlation Between Endometrial Thickness And Phase Of Menstrual Cycle

Phase in menstrual cycle	Range in mm
Proliferative phase	4-8
Secretory phase	7-14
Post-menopausal phase(no HRT)	<5
Post-menopausal phase(on HRT)	6-10

II. Results

Total number of outpatients attending the gynecology department in our tertiary institution during the study period was 12,126 of which AUB in the study population was 47% and perimenopausal bleeding contributed to 27%.

Number Of AUB In Relation To Age (Table-II)

Age In Years	Number Of Cases	Percentage
40-45	60	60
46-50	24	24
>50	16	16
Total	100	100

Of our study group 60% were in age group of 40-45 years, 24% were in the age group of 46-50, and 16% were above 50 years.

TABLE-III AUB In Relation To Parity

Parity	No Of Cases
Nullipara	3
Para 1	7
Para 2	47
Para 3 And Above	43
Total	100

Most patients were para 2, 3 and above.

Table-IV Duration Of AUB

Duration Of AUB	No Of Cases
<6 Months	44
6 Months To 1 Year	33
>1 Year	23
Total	100

Most of the patients with perimenopausal bleeding presented within 6 months.

Table-V AUB In Relation To Type Of Bleeding

Type Of Bleeding	No Of Cases
Heavy Menstrual Bleeding	49
Intermenstrual Bleeding	11
Heavy Prolonged Menstrual Bleeding	6
Postmenopausal Bleeding	17
Frequent Cycles	14
Irregular Cycles	2
Postcoital Bleeding	1

Most common type of bleeding is heavy menstrual bleed, which is followed by postmenopausal bleeding.

Table-VI AUB Associated With Medical Condition

Medical Conditions	No Of Cases	%Percentage
Anemia	27	27
Hypothyroid	5	5
Diabetes	14	14
Hypertension	11	11
Diabetes And Hypertension	2	2

27% of patients were anemic, 5% had hypothyroidism, 14% had diabetes, 11% had hypertension and 2% diabetes with hypertension. Obesity was associated along with other medical conditions in about 15% cases in our study group. Thus the association of AUB with hormonal imbalances in the medical condition are found.

Table-VII Histopathological Findings

Type Of Endometrium	No Of Cases
Proliferative	49
Secretory	17
Atropic	5
Hyperplasia	28 Simple-26, Complex Without Atypia-1, Complex With Atypia-1
Carcinoma	1
Total	100

Table-VIII Transvaginal Ultrasound Findings

Endometrial Thickness	Type Of Endometrium	No Of Cases
<5	Atropic	5
4-7	Proliferative	46
8-14	Secretory	14
14-20	Hyperplasia	34
>20	Carcinoma	1
	Total	100

Table-IX Findings in hysteroscopy

Type of endometrium	No of cases
Proliferative endometrium	50
Secretory endometrium	15
Atropic endometrium	5
Hyperplasia	29
Carcinoma	1
Total	100

Table-X Comparison Of Hysteroscopy And Transvaginal Ultrasonography With Hysteroscopic Guided Biopsy

Type Of Endometrium	Hysteroscopic Guided Biopsy	Transvaginal Sonography	Hysteroscopy
Proliferative Endometrium	49	46	50

Secretory Endometrium	17	14	15
Atropic Endometrium	5	5	5
Hyperplasia	28	34	29
Carcinoma	1	1	1

Out of 100 cases in our study, findings of proliferative, secretory and atropic endometrium are considered normal, whereas hyperplasia including simple hyperplasia, simple hyperplasia with atypia, complex hyperplasia and carcinoma are considered abnormal. In hysteroscopic guided biopsy of total 71 is normal and hyperplasia and carcinoma totalling to 29 cases are abnormal.

III. Statistical Analysis

Table-XI Comparison Of Statistical Value Between Hysteroscopy And TVS

Statistics	Tvs	Hysteroscopy
Sensitivity	89.6%	93%
Specificity	87.3%	95.7%
Positive Predictive Value	74.28%	90%
Negative Predictive Value	95.3%	97%

IV. Discussion

In a similar study conducted by Urvashiverma et al⁴ they concluded that both hysteroscopy and TVS are complimentary and hysteroscopy have therapeutic advantage. Veena et al⁵ stated that accuracy of TVS in detecting endometrial pathology can be increased by hysterosonosolano salphingography. Waleed et al concluded that hysteroscopy is more specific and TVS is sensitive⁶. Rajashree et al⁷ concluded that both endometrial biopsy and TVS have poor sensitivity in detecting endometrial pathology and hence hysteroscopy can be used as first line investigation in AUB.

Table-XII: Various studies comparing TVS with hysteroscopy

STUDY	TRANSVAGINAL SONOGRAPHY				HYSTEROSCOPY			
	SENS	SPEC	PPV	NPV	SENS	SPEC	NPV	PPV
Yela Et Al 2009	95.6%	74.4%	53.3 %	60%	95.7%	83%	82.2%	95.9%
Waleed El Khayat Et Al 2011	92.3	72.72	92.3	72.7	78.75	95.83	98.43	57.5
Ryu Et Al	79	45.8	83	39.3	95	83.3	95	83.3
Urvashiverma Et Al	73.07	95.8	95	76.6	89.99	97.56	97.95	90.56
In Our Study	89.6	87.3	74.2	95.3	93	95.7	90	97

Advantage of hysteroscopy is more prominent when all sizes of the polyps including the smaller ones (<1 cm) were considered. A recent study by Vitner et al. found higher sensitivity and specificity for hysteroscopy in diagnosing uterine myomas, when compared to TVU, whereas TVU had higher sensitivity for diagnosing the retained products of conception⁸. On the other hand, they failed to find a statistical difference between the two methods for the diagnosis of the polyps. In that study, the frequencies of endometrial polyps, uterine myomas and retained products of conception were close to each other: 27, 32 and 38% of the sample population respectively. In contrast, uterine polyps comprised a great proportion of the patient sample in this study (n=129, 47%) and they found better sensitivity and specificity for diagnosing polyps with hysteroscopy; however, the sensitivity advantage of this modality was not evident for polyps greater than 1 cm. Soguktas et al. found better diagnostic value for hysteroscopy when compared to both saline infusion sonography and transvaginal ultrasonography in detecting uterine polyps; however, for detection of any uterine pathology, hysteroscopy and saline infusion sonography had similar efficacy but better than transvaginal ultrasonography⁹. Similarly, Mathlouthi et al¹⁰ and Yela et al¹¹ found diagnostic values in favor of hysteroscopy for the diagnosis of uterine pathologies. In the study by Yela et al., the specificity of TVU in particular was remarkably low (7.4%) for the detection of uterine disease¹¹. Kasraeian et al. examined the diagnostic value of transvaginal ultrasonography in non-bleeding postmenopausal women and found only moderate accuracy to diagnose uterine pathologies¹².

In the study by Vitner et al., the diagnostic value of the combined approach was also examined and authors concluded that the combination of the two methods did not seem to improve the results⁸. This is in line with the findings of our study, in which only the sensitivity of combined approach was superior to both methods in detecting any uterine pathology. For polyps and atrophy, combined approach did not seem to offer sensitivity or specificity advantage over both methods. Dasgupta et al compared the diagnostic accuracies of transvaginal ultrasonography and saline infusion sonography in the assessment of the endometrial cavity in perimenopausal

women on oral progesterone for abnormal uterine bleeding¹³. Those authors concluded that although saline contrast improves the diagnostic accuracy, this improvement was not enough to make it an alternative to hysteroscopy¹³. They recommended hysteroscopy and guided biopsy as the best option; particularly in that specific group of patients in which hormone induced endometrial changes make imaging studies less accurate¹³.

V. Summary

Transvaginal ultrasonography is an easily available, relatively cheap, non invasive and practical method to evaluate uterine pathologies and it causes minimal discomfort to the patient. Therefore, it is used as the initial modality in patients with abnormal uterine bleeding or non-bleeding symptomatic patients. However, its diagnostic value for most of the uterine pathologies makes interpretation of the findings rather challenging. Although results with saline infusion sonography are better, several studies have concluded inferior diagnostic value for TVS when compared to hysteroscopy. Hysteroscopy is gold standard in evaluating women with PMB as it allows direct visualisation and pathological areas can also be biopsied. It is an invasive and expensive procedure with possible surgical risks. TVS is sensitive, less invasive, usually painless, and more cost-effective method and hence it can be used as the first-line tool of assessment in perimenopausal women with AUB. Hysteroscopy could be reserved for cases where an intrauterine lesion was diagnosed on TVS. However, gynaecologists should be able to individualize the choice of diagnostic modality in the workup. Hysteroscopy may be offered as a first-line investigation procedure to older, obese, or diabetic women, those with recurrent PMB, tamoxifen users and women with family history of endometrial cancer.

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