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A comparitive study of transvaginal ultrasonography and hysteroscopy with histopathological examination in detecting endometrial pathology in peri-menopausal and post-menopausal bleeding

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Abstract
Abnormal uterine bleeding is an important cause of ill health and accounts for almost 20 % of all gynaecological visits. Dilatation and curettage has been the diagnostic gold standard for evaluating AUB but it is inaccurate and imprecise. Transvaginal ultrasound facilitates the diagnosis of polyps, submucosal fibroids and endometrial hyperplasia with high sensitivities. Hysteroscopy when combined with directed endometrial biopsy has high sensitivities and specificity in identifying benign and malignant intrauterine disease.
Aims of the study: To study the efficacy of transvaginal sonography and hysteroscopy in detecting endometrial pathology 2. To compare transvaginal sonography and hysteroscopy findings with histopathological results after dilatation and curettage.
Materials and Methods: It was a prospective study which included 100 women who visited AJIMS with complaints of AUB in the peri and postmenopausal age group. All 100 women underwent TVS and hysteroscopy followed by D&C. Results were statistically analyzed to detect the diagnostic accuracy of TVS and hysteroscopy in comparison with the histopathology report.
Results: It was found that the sensitivity, specificity, positive predictive value and negative predictive value of TVS in detecting endometrial pathology was 67.1%, 72.2%,91.1%, 34.2% respectively and that of hysteroscopy was 85.5%,77.8%94.2% and 56% respectively.
Conclusion: As TVS is relatively easier and non invasive, it should be offered in all patients for the diagnosis of endometrial pathologies. In cases where risk of endometrial pathology is high, hysteroscopic guided D&C can be done to achieve optimum results.

Keywords: transvaginal ultrasonography, histopathological examination, post-menopausal bleeding

Introduction
Abnormal uterine bleeding is an important cause of ill health peri- and post menopausal women. In these women there is an increased number of uterine lesions, including endometrial polyps, leiomyomas, endometrial hyperplasia, endometrial carcinoma and adenomyosis which all contribute to the abnormal uterine bleeding seen in this age group [1]. It is one of the commonest gynaecological disorders. It accounts for 20% of gynaecological visit3Abnormal uterine bleeding can arise from a bewildering number of sources. Common methods of evaluation of AUB include dilatation and curettage, transvaginal ultrasonography, hysteroscopy with guided biopsy, saline infusion sonography [4, 5] Dilatation and curettage has long been the diagnostic gold standard for evaluating AUB but it is diagnostically inaccurate and imprecise. In 60% of the women submitted to curettage, less than half of the uterine cavity is sampled with the curette and the source of excessive bleeding is frequently not diagnosed [6, 7]. Submucosal fibroids and polyps are almost always not sampled. As many as 10-30% of endometrial lesions may be missed. Transvaginal ultrasonography is used to measure the endometrial thickness in abnormal uterine bleeding. It facilitates the diagnosis of polyps, submucosal fibroids, endometrial hyperplasia with high sensitivity [3]. Hysteroscopy when combined with directed endometrial biopsy has high sensitivity and specificity in identifying benign and malignant intrauterine disease [8]. Hysteroscopy is more accurate in detecting intracavitory lesions such as fibroids and polyps than blind biopsy alone [2, 9].

Aims & objectives of study

1. To study the efficacy of transvaginal sonography and hysteroscopy in detecting endometrial pathology in perimenopausal and post menopausal bleeding.
2. To compare transvaginal sonography and hysteroscopy findings with histopathological results or dilatation and curettage.

Materials and Method

Prospective study which was approved by ethical committee of AJ Institute of Medical Sciences It consists of 100 perimenopausal and postmenopausal women who presented with abnormal uterine bleeding to Dept of OBG at AJ Institute of medical sciences between January 2017 to June 2017 Informed consent was obtained from the patients included in the study. A detailed clinical history was taken and examination performed following which transvaginal sonography was done using transvaginal probe of frequency of 5 MHZ The following criteria were adopted to express the sonographic results: normal cavity, endometrial thickening (>12 mm for premenopausal women and $\geq$ 4 mm for postmenopausal women) and endometrial atrophy (Endometrial thickness < 4 mm) [13]. Hyperechogenic nodular lesions in the endometrial cavity were considered as polyps, while lesions with mixed echogenicity or hypoechoic lesions altering the contours of the endometrial cavity were considered as submucosal myomas. Findings were considered as suspected for malignancy in cases where the endometrial echo was irregular or with a variable echotexture After imaging the uterus, the parametrium and adnexa were imaged. Routine pre operative investigations were performed.

All hysteroscopies were scheduled as elective case and performed under general anesthesia using a standard STORZ 4mm telescope with 0 degree lens and a 5mm diagnostic heath. Illumination is provided by a high intensity Xenon cold light source. The patient placed in lithotomy position Normal saline was used as the distension medium at a pressure of 150-200 mm Hg. Constant uterine irrigation is obtained through continous flow sheath. Hysteroscope is guided through endocervical canal to the uterine cavity under visual control. Tubal ostia were identified. Endometrial cavity is thoroughly inspected. Cervical canal is then identified in its entire length during with drawl of hysteroscope. The hysteroscopic finding was defined as normal (Normal or atrophic endometrium) or abnormal (Presence of focal or diffuse thickening, polyps, myomas or synechiae). Hysteroscopy was followed by D& C. Specimen obtained was collected in a bottle containing formalin and send to pathology department for histopathological examination

Observation and Analysis

100 patients with abnormal uterine bleeding were studied. All the patients underwent transvaginal sonography followed by hysteroscopy and histopathological analysis of the endometrial sample Ages of the patients in the study group range from 36 years to 75 years with maximum number of cases (62%) in the age group ranging 36-45 years The parity of the patients ranged from nullipara to para 9 with maximum number of cases being para 2(43%).

Table I: Clinical diagnosis

Diagnosis	Frequency	Percent
DUB	81	81
Post-menopausal bleeding	13	13
Fibroid	6	6
Total	100	100

81% were diagnosed to have DUB

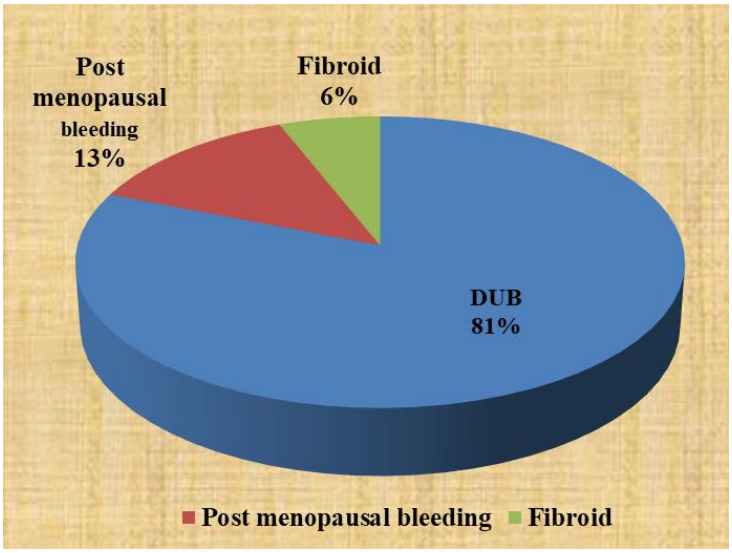

Table II: Type of bleeding pattern

Type Of bleeding	Frequency	Percent
Menorrhagia	44	44.0
Irregular cycles	16	16.0
Polymenorrhagia	21	21.0
Post menopausal bleeding	13	13.0
Metrorrhagia	4	4.0
Continuous bleeding	2	2.0
Total	100	100.0

Menorrhagia was the most common complaint followed by polymenorrhagia

Table III: Endometrial thickness measured by transvaginal sonography

ET	Frequency	Percent
1-9.9	33	33
10-19.9	58	58
20-29.9	8	8
30-39.9	1	1
Total	100	100

Endometrial thickness ranged from 3 – 32mm

58% had endometrial thickness between 10-19.9 mm

Table IV: TVS findings

TVS	frequency	Percentage
Hyperplasia	54	54
Normal	37	37
Fibroid	4	4
Fibroid +hyperplasia	2	2
Polyp + hyperplasia	1	1
Malignancy	2	2
Total	100	100

Maximum cases (54%) had hyperplasia on TVS

Table V: Hysteroscopy findings

Hysteroscopy	Frequency	Percent
Normal	24	24.0
Hyperplastic	54	54.0
Polyp	8	8.0
fibroid	6	6.0
Atrophic	6	6.0
Carcinoma	1	1.0
Adhesions	1	1.0
Total	100	100.0

Hyperplastic endometrium (54%) was the most common hysterscopy finding

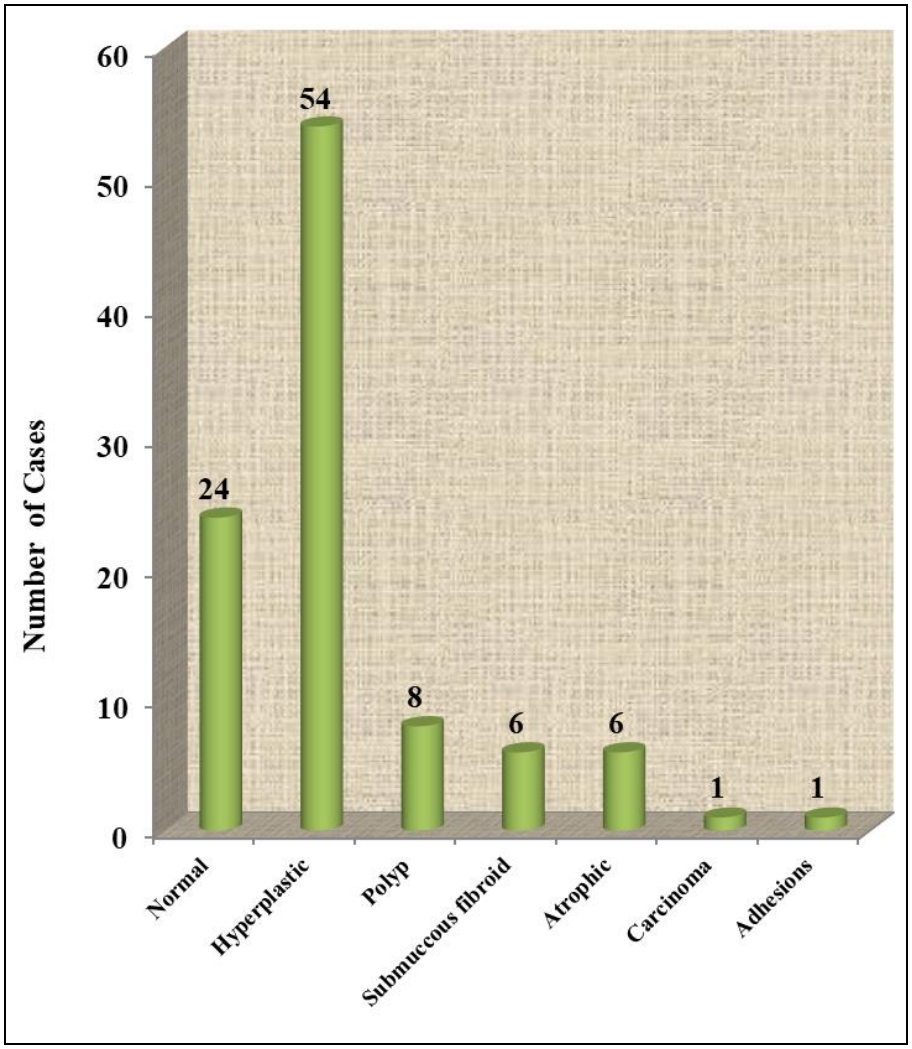

Table: Hyperplastic endometrium was the most common finding

Histopathology	Frequency	Percent
Secretory Endometrium	18	18.0
Proliferative endometrium	15	15.0
Simple endometrial Hyperplasia with out atypia	22	22.0
Simple endometrial hyperplasia with atypia	9	9.0
Complex hyperplasia without atypia	9	9.0
Complex hyperplasia with atypia	6	6.0
Insufficient	6	6.0
Pill endometrium	8	8.0
Endometritis	1	1.0
Carcinoma	3	3.0
Atrophic endometrium	1	1.0
Irregular shedding	1	1.0
Endometrial polyp	1	1.0
Total	100	100.0

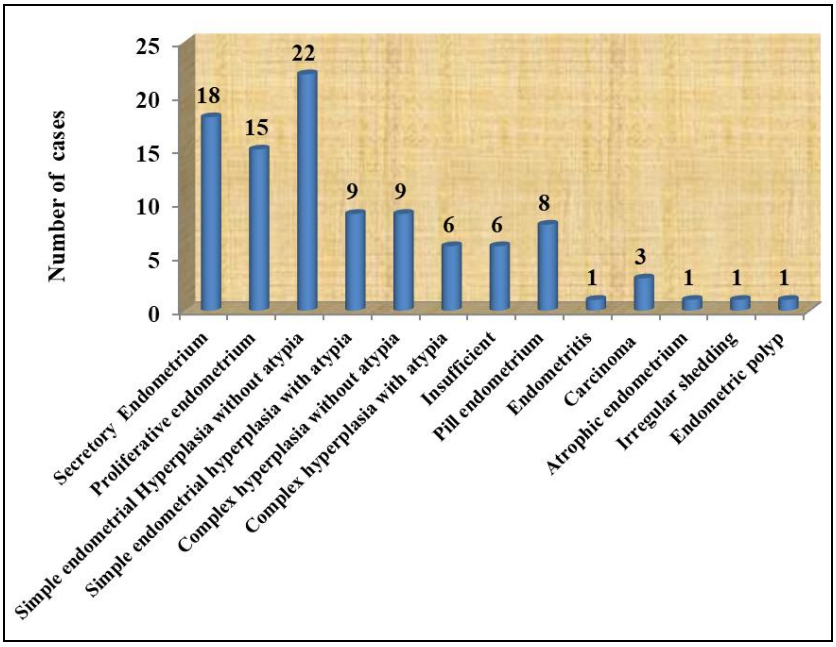

Table VI: Correlation between histopathology and TVS findings

histopathology	N	Mean	Minimum	Maximum
Secretory endometrium	18	16.4444	6.00	26.00
Proliferative endometrium	15	13.8000	6.00	21.00
Simple endometrial hyperplasia without atypia	22	18.3636	7.00	32.00
Simple endometrial hyperplasia with atypia	9	11.1111	5.00	15.00
Complex endometrial hyperplasia without atypia	9	13.6667	10.00	20.00
Complex endometrial hyperplasia with atypia	6	10.6667	6.00	18.00
Carcinoma	3	19.0000	12.00	30.00
Pill endometrium	8	10.2500	5.00	16.00
Irregular shedding	1	13.0000	13.00	13.00
Endometritis	1	14.0000	14.00	14.00
Atrophic	1	6.0000	6.00	6.00
Insufficient	6	6.3333	3.00	10.00
Endometrial polyp	1	6.0000	6.00	6.00

Table VII: Correlation between hysteroscopy and histopathological diagnosis

Hysteroscopy	Histopathology													Total
	secretory	proliferative	SEH Without atypia	SEH With atypia	CEH without atypia	CEH With atypia	CA	Pill endometrium	Irregular Shedding	Endomet - ritis	Atrophic	insufficient	Polyp	
Normal	14	5	1	0	1	1	0	2	0	0	0	0	0	24
Hyperplasia	4	10	17	7	5	5	2	3	1	0	0	0	0	54
Polyp	0	0	2	0	3	0	0	1	0	1	0	0	1	8
Fibroid	0	0	2	1	0	0	0	2	0	0	0	1	0	6
Growth	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Atrophic	0	0	0	0	0	0	0	0	0	0	1	5	0	6
Adhesions	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	18	15	22	9	9	6	3	8	1	1	1	6	1	100

SEH-Simple endometrial hyperplasia
CEH-complex endometrial hyperplasia
Ca -carcinoma

Discussion

This study was conducted on 100 patients with abnormal uterine bleeding. All 100 patients underwent TVS for endometrial thickness followed by hysteroscopy and hysteroscopy guided endometrial sampling. Histopathological examination was carried out on endometrial samples obtained.

13 were post menopausal and 87 were perimenopausal patients.

1. All 100 cases underwent TVS, hysteroscopy followed by endometrial sampling.
2. Considering histopathology as the gold standard, comparision of TVS and hysteroscopy was done with Histopathological results.
3. In TVS, endometrial thickness ranged from 3-32 mm, maximum cases (58%) were between 10-19.9mm In premenopausal women, the endometrial thickness ranged from 5-32 mm in post menopausal women, the endometrial thickness ranged from 3-30 mm
4. In perimenopausal women cut off value of more than 12mm

endometrial thickness and post menopausal cut off value of more than 4mm was considered abnormal. In our study 54 cases showed hyperplasia (>12 mm in perimenopausal and >_4mm in postmenopausal, 37 had normal endometrium, 4 showed fibroid, 2 showed fibroid + hyperplasia, 1 showed polyp + hyperplasia, and 2 showed malignancy

5. Mean endometrial thickness in proliferative phase was 13 mm, 16mm in secretory phase, 18 mm in hyperplastic endometrium, three cases of malignancy were detected in histopathology. One case had ET of 15mm, one had 30 mm, and one 12 mm TVS was more sensitive than hysteroscopy in detecting malignancy (66% vs 33%)
6. The sensitivity, specificity, Positive predictive value and negative predictive value in detecting endometrial pathology was 67.1 %, 72.2%, 91.1%, 34.2% respectively.
7. Hysteroscopy identified 24 cases of normal endometrium, 54 cases of hyperplastic,8 cases of polyp, 6 cases of fibroid, 6 cases of atrophic,1case of adhesion,1 case of carcinoma
8. Out of 24 cases of normal endometrium, 14 (63%) cases were confirmed by histopathology,34 cases of hyperplasia, out of which 17 had simple endometrial hyperplasia without atypia, 7 had simple endometrial hyperplasia with atypia. 5 had complex endometrial hyperplasia without atypia, 5 had complex hyperplasia with atypia, all 6 cases of fibroid, all 6 cases of atrophy, 7 cases of polyp and one case of carcinoma
9. The sensitivity, specificity, positive predictive value, negative value of hysteroscopy was 85.5 %, 77.8%, 94.2%, 56% respectively

The overall accuracy of transvaginal ultrasonography and hysteroscopy to diagnose abnormal endometrium are as follows:

1. Present study

	Sensitivity	Specificity	PPV	NPV
Tvs	67.1%	72.2%	91.1%	34.2%
Hysteroscopy	85.5%	77.8%.	94.2%	56%

Other studies

2. Daniela ange Ra Me yela *et al* 2006 [42],

	sensitivity	Specificity	PPV	NPV
Tvs	95.6%	7.4%	53.3%	60%
Hysteroscopy	95.7%	83%	82.2%	95.9%

3. Diaa EL Mowafi *et al* 2008 [47]

	sensitivity	Specificity	PPV	NPV
Tvs	73.9%	73.7%	77.3%	70%
Hysteroscopy	78.3%	84.2%	85.7%	76.2%

4. Garuti g *et al* 2000 [48]

	sensitivity	Specificity	PPV
TVS	95.1%	54.8%	63.7%
Hysteroscopy	96.5%	93.6%	92.6%

Summary

100 cases attended OPD with diagnosis of perimenopausal and postmenopausal bleeding were analyzed. Study was aimed to study the efficacy of transvaginal sonography and hysteroscopy in detecting endometrial pathology and to compare TVS and hysteroscopy with histopathological results of D&C biopsy.

1. Patients belonged to various age groups. Maximum number of cases was in the age group of 36-45 years (62 %)
2. Menorrhagia was the commonest presentation in 44 % of the patients.
3. AUB was more common in parous patients.

Conclusion

TVS is relatively cheap, easy, needs no anesthesia, non invasive, it should be the first diagnostic test in the investigation of women with perimenopausal and post menopausal bleeding.

TVS can select those cases in which the likelihood of endometrial pathology is high in these cases hysteroscopy guided biopsy should be used for achieving a proper diagnosis

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