

Comparative Study of the Diagnostic Accuracy of Transvaginal Sonography vs Hysteroscopy in Abnormal Uterine Bleeding

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ABSTRACT

Introduction: Abnormal uterine bleeding (AUB) is one of the most common symptoms with which patients visit to a gynecologist. Abnormal uterine bleeding is responsible for more than one-third of gynecological consultations and nearly two-thirds of hysterectomies.¹

Aims and objectives:

- To evaluate the accuracy of hysteroscopy in diagnosing various conditions causing AUB.
- To compare hysteroscopic findings with transvaginal sonography (TVS) findings.

Materials and methods: A prospective study was conducted on 100 women fitting into the inclusion criteria in the Department of Obstetrics and Gynaecology at Vydehi Institute of Medical Sciences and Research Center, Bengaluru. Detailed history, clinical examination, TVS, hysteroscopy, and preoperative investigations were carried out and results were correlated.

Results: In the present study, majority of the patients were in perimenopausal age group. Transvaginal sonography has showed 12% and 8.3% sensitivity in detecting polyp and submucosal fibroid when compared to hysteroscopy. Transvaginal sonography showed poor correlation with hysteroscopic findings for intracavitary pathology. Intrauterine adhesions were missed by TVS in three cases which were diagnosed by hysteroscopy.

Conclusion: There is an increased incidence of intracavitary uterine pathology in patients who present with AUB. The poor sensitivity of TVS in detecting intrauterine pathology urges us to suggest that hysteroscopy can be utilized as a first-line investigation in these patients. As many cases with intracavitary lesions and carcinoma were not diagnosed by TVS, the need for number of diagnostic hysteroscopies (invasive) could not be minimized by TVS (noninvasive) examinations. Hysteroscopy can be used not only for therapeutic purpose but also for diagnostic tool in cases who present with AUB, clinically enlarged uterus, and significant anemia.

Keywords: Abnormal uterine bleeding, Hysteroscopy, Intracavitary lesions, Menorrhagia, Transvaginal sonography.

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INTRODUCTION

Abnormal uterine bleeding (AUB) is one of the most common symptoms with which patients visit to a gynecologist. Eventually every woman in her lifetime at some point experience some episodes/cycles of bleeding that is considered as abnormal. Abnormal uterine bleeding is defined as any type of bleeding in which the duration, frequency, or amount of bleeding is excessive for any particular individual patient.¹

Abnormal uterine bleeding occurs in 9–14% of women between menarche and menopause, which significantly have an impact on the quality of life and impose certain amount of financial burden to the women.

Abnormal uterine bleeding can occur due to a wide variety of conditions. Although sometimes it may represent a normal physiological state that may require only observation, but it can also be an indirect sign of other more or less serious underlying disease that may require aggressive treatment that could even need a hysterectomy. Because of its broad range of differential diagnosis, the diagnosis of AUB can be quite challenging for the gynecologist; despite a detailed history, various blood tests, and a thorough pelvic examination which also involves abdominal or transvaginal ultrasonography (TVS), the cause of the bleeding is established in only 50–60% of the cases.

Before instituting any therapy, the clinician must be confident that the correct diagnosis has been reached because of the

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consequences of the bleeding and the implications of treatment. Many authors have suggested endometrial sampling must be taken in all women ≥ 35 years old with AUB.

Though dilation and curettage was the primary method of evaluating AUB before the evolution of hysteroscopy, it is a blind and incomplete procedure. During this procedure in 60% of the patients, it will only scrap <50% of the endometrial cavity, which becomes less accurate when compared to hysteroscopy in diagnosing structural pathology like polyps, fibroids, intrauterine adhesions, and congenital malformations. It has a cancer detection

failure rate of 0.9%. Transvaginal sonography by virtue of its ability to place, the high frequency transducer nearer to origin of interest, permits better magnified visualization of genital organs especially uterus and endometrium, which can be studied more accurately than abdominal scan.

Hysteroscopy allows us to have a direct visualization of the cervical canal and uterine cavity, which helps us in better evaluation of intrauterine abnormalities. This is safe procedure and will lead to more accurate diagnosis and specific surgical or medical treatment can be directed at the specific pathology.

AIMS AND OBJECTIVES

- To find out the accuracy of hysteroscopy in diagnosing different conditions causing AUB.
- To correlate hysteroscopic findings with TVS findings.

MATERIALS AND METHODS

- Source of data—patients admitted in Vydehi medical college with AUB.
- Sample size—maximum available patients in a period of 2 years.
- Study design—prospective type of study.

It is a prospective type of study on 100 patients, who have attended the Department of Obstetrics and Gynaecology at Vydehi medical College, Bengaluru in the last 2 years with complaints of AUB. All patients presented with AUB were admitted in the hospital. After thorough history and clinical examination, patients were subjected to TVS examination. Patients underwent diagnostic hysteroscopy. Hysteroscopy findings were noted at the time of the examination and documented.

RESULTS

The age of my patients were from 21 to 64 years. Maximum number of patients who came with AUB belonged to the age group 41 to 50 years ($n = 38$). Eighteen patients were above 50 years and 17 patients below 30 years.

Most common presenting complaint was excessive bleeding through vagina in 47% of cases which was followed by postmenopausal bleeding in 22% of cases (Table 1).

Most common findings of TVS and hysteroscopy were secretory phase TVS showed in 31 cases and hysteroscopy showed in 20 cases. Hysteroscopy had 15 cases of polypoidal endometrium and 6 cases of mucosal polyp, which were not diagnosed by TVS (Tables 2 and 3).

Hysteroscopy was taken as gold standard and TVS was compared with it. p value was highly significant in cases of atrophic

Table 1: Presenting complaints

Symptoms	No. of patients ($n = 100$)	(%)
Excessive bleeding	47	47.0
Increased frequency of bleeding	12	12.0
Irregular cycle	19	19.0
Postmenopausal bleeding	22	22.0
Continuous bleeding >21 days	6	6.0
Decreased bleeding	3	3.0
Increased duration of bleeding	7	7.0

endometrium, proliferative endometrium, hyperplasia, polyp, and submucosal fibroid (Table 4).

Transvaginal sonography had showed atrophic endometrium in 8 patients, whereas 12 patients had atrophic endometrium in hysteroscopy, so TVS had missed 4 patients among them. Intracavitary abnormalities like polyp and submucosal fibroid were better diagnosed with hysteroscopy than TVS. Transvaginal sonography had diagnosed only 3 patients with polyp, whereas 25 patients with polyp were diagnosed by hysteroscopy. Transvaginal sonography had diagnosed only 1 patient with submucosal fibroid, whereas 12 patients with submucosal fibroid were diagnosed by hysteroscopy (Table 5).

DISCUSSION

In the present study "Diagnostic accuracy of Hysteroscopy in abnormal uterine bleeding", 100 patients with symptoms of AUB have undergone both TVS and hysteroscopy. Diagnostic accuracy of TVS is compared with hysteroscopy.

Perimenopausal women with symptoms of AUB constitute a large proportion of gynecological consultations.² Most common pathologies causing AUB in perimenopausal patients were submucous fibroids, endometrial polyps, and endometrial hyperplasia. Correct diagnosis of the etiology may help the gynecologist to give treatment which is directed at the specific pathology, so patient will not be getting other not indicated investigations, medications, and may even avoid undergoing a major surgery.

The most frequently used diagnostic tests for the evaluation of AUB are hysteroscopy, sonohysterography, and TVS, either alone or in combination. It has been seen that the accuracy of various diagnostic tests that are available are often poorly understood by the person who orders and who performs the diagnostic procedures.³ Therefore, it is essential for the gynecologist to understand the

Table 2: TVS findings of patients studied

TVS	No. of patients ($n = 100$)	(%)
Atrophic	9	9.0
Proliferative	15	15.0
Perioovulatory	24	24.0
Secretory	31	31.0
Hyperplasia	21	21.0

TVS, transvaginal sonography

Table 3: Hysteroscopy in patients studied

Hysteroscopy	No. of patients	(%)
Atrophic	11	11.0
Proliferative endometrium	14	14.0
Secretory	20	20.0
Hyperplastic	14	14.0
Polypoidal endometrium	15	15.0
Mucosal polyp	6	6.0
Submucosal myoma	13	13.0
Carcinoma	5	5.0
Intrauterine synechiae	2	2.0
Total	100	100.0

Table 4: Correlation of TVS findings with hysteroscopy findings

TVS vs hysteroscopy	TP	FP	FN	TN	Sensitivity	Specificity	PPV	NPV	Accuracy	p value
Atrophic	7	1	5	87	58.33	98.86	87.50	94.57	94.00	<0.001**
Proliferative	8	7	7	78	53.33	91.78	53.33	91.76	86.00	<0.001**
Periovalutary	1	23	0	76	100.00	76.77	4.17	100.0	77.00	0.074+
Secretory	11	20	12	57	47.83	74.03	35.48	82.61	68.00	0.046*
Hyperplasia	9	13	7	71	56.25	84.52	40.91	91.03	80.00	<0.001**
Polyp	3	0	22	75	12.00	100.00	100.0	77.32	78.00	0.002**
Submucous fibroid	1	0	11	88	8.33	100.00	100.0	88.89	89.00	0.006**
Intramural fibroid	0	20	0	80	0.0	80.00	0.0	100.0	80.0	1.000
Carcinoma	0	0	6	94	0.0	100.0	50.0	94.0	94.0	1.000
Intrauterine adhesions	0	0	3	97	0.0	100.0	50.0	97.0	97.0	1.000

** , p value < 0.01; + , p value = 0.05–0.10; * , p value = 0.01–0.05. TVS, transvaginal sonography

Table 5: Comparison of findings of TVS and hysteroscopy

S. no	Hysteroscopy (n = 100)	TVS (n = 100)
1	Atrophic endometrium (n = 11) Atrophic with submucosal fibroid (n = 1)	Atrophic (n = 9) Proliferative (n = 2)
2	Proliferative (n = 15)	Proliferative (n = 15)
3	Periovalutary (n = 1)	Periovalutary (n = 24)
4	Secretory (n = 23) Secretory with polyp (n = 3)	Secretory (n = 30)
5	Hyperplasia (n = 16) Hyperplasia with polyp (n = 3) Hyperplasia with fibroid (n = 3) Hyperplasia with ca (n = 1)	Hyperplasia (n = 22)
6	Polyp (n = 25)	Polyp + hyperplasia (n = 3) Periovalutary (n = 6) Secretory (n = 12) Hyperplasia (n = 4)
7	Submucosal fibroid (n = 12)	Periovalutary (n = 4) Hyperplasia (n = 5) Atrophic (n = 1) Secretory (n = 2)
8	Carcinoma (n = 6) Hyperplasia with ca (n = 1)	Hyperplasia (n = 1) Secretory (n = 1) Periovalutary (n = 2) Proliferative (n = 2)
9	Intrauterine adhesions (n = 3) Intrauterine adhesion + polyp (n = 1)	Hyperplasia + polyp (n = 1) Secretory (n = 1) Periovalutary (n = 1)

TVS, transvaginal sonography

accuracy of various diagnostic methods in the evaluation of AUB. During the last two decades, TVS is being proposed as an alternative or a complementary investigation to hysteroscopy in the evaluation of patients with AUB.⁴ Reliability of TVS in excluding the presence of intracavitary disorders in premenopausal and postmenopausal females has been demonstrated repeatedly and some others have even questioned the appropriateness of hysteroscopy after a negative TVS.

In this study, majority of the patients were in perimenopausal age group. The studies conducted by Emanuel,² Sheth,⁵ Towbin,⁴ and Veena and Nirmala⁶ have also found similar clinical presentations in their studies. This suggests majority of the patients of AUB were in perimenopausal age.

In this study group, menorrhagia (heavy or prolonged bleeding) is the commonest symptom presented by the patients, which correlates with the studies performed by Emanuel² and Veena and Nirmala.⁶

In this study group, TVS has showed 12% and 8.3% sensitivity in detecting polyp and submucosal fibroid when compared to hysteroscopy. Studies performed by Veena and Nirmala⁶ also showed 22% sensitivity for polyps.

According to Vitner,⁷ the results of TVS performed immediately prior to hysteroscopy did not affect the decision to perform hysteroscopy. In his study, he mentioned hysteroscopy is needed not only as an operative tool but also as a diagnostic tool. The accuracy of hysteroscopy in diagnosing uterine abnormalities was

more appropriate in cases of intrauterine polyps and submucous fibroids.

In this study, 15 cases who had presented with postmenopausal bleeding had endometrial thickness of <4 mm in 8 cases which was consistent with hysteroscopic findings. But, TVS showed endometrial thickness >4 mm in four cases but hysteroscopy showed atrophic endometrium. Three cases of postmenopausal bleeding (PMB), which had normal endometrial thickness in TVS, had cancerous lesions on hysteroscopic examination. One case of PMB patient had submucosal fibroid, which was picked up only by hysteroscopy. Hence, these results may suggest us that hysteroscopy is superior to TVS in providing accurate results in postmenopausal patients with endometrial thickness >4 mm. Similar findings were also seen by Veena and Nirmala⁶ in their study, six postmenopausal patients who had endometrial thickness of <4 mm TVS findings were consistent with hysteroscopic findings. One case of postmenopausal bleeding with endometrial thickness of 12 mm had hyperplastic endometrium. One more postmenopausal had endometrial polyp, which was picked up only by hysteroscopy.

In this study, TVS showed 58.33% sensitivity, 98.86% specificity, and accuracy of 94% for atrophic phase. 53.33% sensitivity and 91.7% specificity, accuracy of 86% for proliferative phase. 47.83% sensitivity, 74.03% specificity, and accuracy 68% for secretory endometrium. 56.25% sensitivity, 84.52% specificity, and accuracy of 80% for hyperplastic endometrium. Similar findings were seen by Veena and Nirmala⁶ in this TVS showed an accuracy of 83.3% in detecting the proliferative phase and 66.67% in detecting secretory phase.

In this study, intrauterine adhesions were missed by TVS in three cases, which was diagnosed by hysteroscopy, similar findings were seen in studies performed by Veena and Nirmala⁶ in which one case of intrauterine synechiae was missed by TVS where the patient had come with the complaints of metrorrhagia of 6-month duration.

The accuracy of TVS can be improved by the instillation of saline solution into uterine cavity to outline the contour of lesions (hysterosonosalpingography), which is also an invasive procedure. But, hysteroscopy being the gold standard in diagnosing intracavitary lesions, it can be performed instead of hysterosonosalpingography as hysteroscopy also leads to direct visualizations of intracavitary lesions. Veena and Nirmala,⁶ Farquhar,⁸ and Dijkhuizen⁹ also give the similar opinion in their studies.

CONCLUSION

There is an increased incidence of intracavitary uterine pathology in patients who present with AUB. It is true when we consider the

women in the age group of 35–50 years who present with heavy and regular bleeding, clinically enlarged uterus, and significant anemia. The poor sensitivity of TVS in detecting intrauterine pathology urges us to suggest hysteroscopy, which can be utilized as a first-line investigation in these patients.

As many cases with intracavitary lesions and carcinoma were not diagnosed by TVS, the need for number of diagnostic hysteroscopies (invasive) could not be minimized by TVS (noninvasive) examinations.

Hysteroscopy can be used not only for therapeutic purpose but also for diagnostic tool in cases who present with AUB, clinically enlarged uterus, and significant anemia.

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