ORIGNAL ARTICLE

ROLE OF TRANSVAGINAL ULTRASOUND IN IDENTIFYING ENDOMETRIAL HYPERPLASIA

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Background: Transvaginal sonography (TVS) is one of the diagnostic modalities used to evaluate endometrial pathologies in women with abnormal uterine bleeding. It permits use of high frequency ultrasound waves at greater proximity to the uterus. This study aimed at determining the diagnostic accuracy of TVS in identifying endometrial hyperplasia by comparing with histologic findings in perimenopausal women with abnormal uterine bleeding. **Methods:** This cross-sectional study was conducted in Department of Obstetrics & Gynaecology, Unit II, Fauji Foundation Hospital, from Sep 2011 to Mar 2012. A total of 263 perimenopausal women aged 40–50 years with abnormal uterine bleeding in the form of menorrhagia, metrorrhagia and polymenorrhagia were enrolled. Thickness of the endometrium was first measured by ultrasound and then was later confirmed by sampling of endometrium. The outcome was measured in terms of accurately diagnosing endometrial hyperplasia by TVS and then using histologic findings as gold standard to confirm. **Results:** The mean age of selected patients was 45.3±3.2 years. Out of total 263 cases, 129 (49.0%) presented with menorrhagia, 120 (45.6%) presented as metrorrhagia while 14 (5.3%) had polymenorrhagia. The sensitivity and specificity of TVS was 100.0% and 63.7% respectively. Similarly positive predictive value (PPV) and negative predictive value (NPV) were 56.3% and 100.0% respectively. Diagnostic accuracy of TVS in identifying endometrial hyperplasia using histopathology as gold standard was found to be 75.6%. **Conclusion:** TVS has a moderate diagnostic accuracy in detecting endometrial hyperplasia. Due to the fact that transvaginal ultrasound is safe, acceptable and easily available in most secondary and tertiary care settings and is non-invasive in nature, in our opinion TVS is to be used as a 1st line diagnostic tool in patients who present with abnormal uterine bleeding.

Keywords: Diagnostic accuracy, TVS, endometrial hyperplasia, perimenopausal women

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INTRODUCTION

Menstrual irregularity is one of the common symptoms of women who are seeking gynaecological care. The prevalence of abnormal uterine bleeding is difficult to determine but 9–30% of women in reproductive age group suffer from menstrual irregularity requiring medical evaluation.[1] Abnormal uterine bleeding (AUB) is a common presentation in the gynaecological outpatients. It is responsible for more than 20% of all visits to outpatient clinics and many account for more than 25% of all hysterectomies.[2,3] The actual prevalence of AUB is difficult to determine however, about 9-30% of women in the reproductive age group suffer from menstrual irregularity and consequently need medical evaluation.[1] Previous literature on AUB in perimenopausal women demonstrated prevalence of endometrial hyperplasia, endometrial polyp and adenocarcinoma as 11.8%, 4.2% and 5.5% respectively.[4]

There are many diagnostic modalities for evaluating endometrial pathologies in women who have AUB. These include dilatation and curettage (D & C) and hysteroscopy. Recently transvaginal sonography (TVS) has permitted the use of higher frequency ultrasound waves at greater proximity of the uterus. It is relatively cheap, needing no anaesthesia, is non-invasive and can be the first diagnostic step in the evaluation of AUB.

We can see profound lack of consensus among the health care organizations regarding the cut off age for performing endometrial sampling in perimenopausal women with AUB.[5] Local studies show the incidence of simple cystic hyperplasia as 66.6%, adenomatous hyperplasia 20% and atypical hyperplasia 13.3%.[6] Endometrial hyperplasia is a known precursor for endometrial carcinoma and its progression to more severe pathology is time related. Less than 2% of hyperplasia without atypia progress to endometrial carcinoma in 23% over a mean duration of 4 years. Literature review shows that thickness of endometrial measured by TVS correlated well with results obtained on histopathology.[7,8]

This study emphasised on the evaluation of abnormal perimenopausal bleeding for early detection of endometrial hyperplasia which is a precursor of endometrial carcinoma by using TVS and comparing with histological findings thus improving the quality of life and life expectancy of perimenopausal women. Based on various results from previous studies, this study attempted to explore the usefulness of TVS.

MATERIAL AND METHODS

Over a period of 6 months, a cross sectional study based on non-probability consecutive sampling technique was conducted in Department of Obstetrics and Gynaecology, Fauji Foundation Hospital, Rawalpindi. Women aged 40–50 years having abnormal uterine bleeding in the form of menorrhagia, metrorrhagia and polymenorrhagia were included in the study. Patients with fibroid uterus, ovarian cyst, cervical polyp, genital tract malignancy and comorbids like liver diseases, bleeding disorders, and hypo/hyperthyroidism were excluded. Patients taking hormone replacement therapy (HRT), tamoxifen and with bleeding due to pregnancy were also excluded from the study.

A detailed history regarding age, parity, menstrual cycle, past medical, drug and contraceptive method used was taken followed by general physical, systemic, per speculum and bimanual pelvic examination. TVS was performed to measure the thickness of endometrium in the follicular phase of the menstrual cycle by single observer. Endometrial thickness >8 mm was taken as cut off for endometrial hyperplasia. Investigations including blood complete picture, random blood sugar and viral serology were performed. After taking informed consent, dilatation and curettage was done in premenstrual phase. The specimens were sent for histopathological examination to consultant histopathologists. Findings were recorded in the proforma and analysed using SPSS-16. The qualitative variables like simple cystic hyperplasia, complex adenomatous hyperplasia, atypical hyperplasia and menstrual irregularity (menorrhagia, metrorrhagia, polymenorrhagia) were analysed as percentages. A 2×2 table was constructed to determine the sensitivity, specificity, PPV and NPV of TVS.

RESULTS

A total of 263 perimenopausal women who presented with AUB were enrolled. The mean age of study patients was 45.3±3.2 years. Most of the cases 135 (51.3%) were between 40–45 years of age while 128 (48.7%) were between 46–50 years. In our study only seven (2.6%) patients were nulliparous while majority were multiparous. Out of total, 129 (49.0%) of the cases presented with menorrhagia, 120 (45.6%) presented with metrorrhagia and 14 (5.3%) presented with polymenorrhagia. The average endometrial thickness measured on TVS was 10.2±5.8 mm in the study. The values of true and false positive, true and false negative were calculated using 2×2 table (Table-1).

TVS has high sensitivity and NPV. In our study the different types of endometrial hyperplasia ere also analysed (Table-2). Simple cystic hperplasia was the commonest seen in 22% of patients (Table-3).

Table-1: Distribution of true positive, false positive, false negative and true negative in the study (n=263)

	Number	%
True positive	84	31.7%
False positive	66	24.9%
False negative	0	0.0%
True negative	115	43.4%

Table-2: Diagnostic accuracy of TVS in diagnosing endometrial hyperplasia using histopathology as gold standard (n=263)

Sensitivity	100.0%
Specificity	63.7%
PPV	56.3%
NPV	100.0%
Diagnostic accuracy	75.6%

Table-3: Types of endometrial hyperplasia (n=263)

Hyperplasia	Number	%
Simple cystic hyperplasia	58	22.1%
Complex adenomatous hyperplasia	14	5.3%
Atypical hyperplasia	11	4.2%

DISCUSSION

In our study the mean age of study patients at presentation was 45.3±3.2 years. In a local study by Najeeb R *et al* the average age of patients was found to be 44 years.[3] Another study by Aslam M *et al* also revealed quite similar age of presentation (38.3±9.6 years).[9] In this study the menstrual history of patients showed menorrhagia in 49%, metrorrhagia in 45.6% and polymenorrhagia in 5.3% of cases. Majority (97.4%) of our patients were multiparous.

Our results showed the sensitivity and specificity of TVS in diagnosing endometrial hyperplasia as 100.0% and 63.7% respectively. Similarly, the PPV and NPV was 56.3% and 100.0% respectively. Large scale studies have reported experiences with TVS. A study by Aslam M *et al* reported sensitivity and specificity of 81.3% and 73.6% respectively in diagnosing endometrial hyperplasia. They reported a similar trend as in our study with low PPV and high NPV 46.3% and 93.3%.[9] In another study by Najeeb R *et al* and colleagues the sensitivity and specificity was 100.0% and 94.7% respectively in diagnosing endometrial hyperplasia.[3]

Previous literature also shows evidence in contrast to our findings. A study by Balic D *et al* revealed that the sensitivity of TVS in the diagnosis of endometrial hyperplasia was lower than the one provided by hysteroscopy (22.7% vs 86.4%, $p<0.001$), while specificity was identical, i.e., 100%. They concluded that hysteroscopy appeared to be better reliable in diagnosis of endometrial hyperplasia than TVS; furthermore the authors argued that the use of a high frequency USG probe leads to a lack of clarity in

diagnosing between endometrial polyps and hyperplasia.[10,11]

The overall diagnostic accuracy of TVS for endometrial hyperplasia in our study was 75.6%. A study by Aslam M *et al* reported that the overall diagnostic accuracy of TVS was 75.3% which is almost equivalent to our study findings.[9] The TVS plays an vital role in the assessing of AUB but its ability to screen pathology within the endometrial cavity is variable and limited to some extent.[12,13] The common findings of a thickened central endometrial complex seen on TVS are often non-specific and may be caused by an endometrial polyp, submucosal fibroid, endometrial hyperplasia or endometrial carcinoma. Mostly lesions that are focal are under diagnosed at TVS because of limitations of the double layer thickness evaluation.[14,15] We found TVS to be highly reliable in detecting endometrial hyperplasia with 100% sensitivity however; it was not proven as sensitive before.

A systematic review of transvaginal ultrasonography, sonohysterography and hysteroscopy for the investigation of AUB in premenopausal women proved that though there is a considerable variability present, all three diagnostic modalities were moderately accurate in detecting intra uterine abnormalities.[15] A previous study showed that TVS allows detection of an endometrial pathology in majority of cases, as it has been reported to be a valid, safe and non-invasive method which needs no anaesthesia so it can be used as the first line diagnostic tool in investigating AUB in perimenopausal age group.[9] The strength of this study is its sample size as a large number of perimenopausal women with AUB were studied. Secondly, this is one of the very few studies done nationally to validate the diagnostic strength of TVS in detecting endometrial hyperplasia.

CONCLUSION

Transvaginal sonography has a moderate diagnostic accuracy in detecting endometrial hyperplasia. Due to the fact that TVS is safe, acceptable and easily available in most secondary and tertiary care settings nowadays and is non-invasive.It should be continued as 1st line diagnostic tool in patients with AUB. However, for generalisation of our findings more evidence on this topic is required.

REFERENCES

1. Yasmin F, Farrukh R, Kamal F. Efficacy of pipelle as a tool for endometrial biopsy. Biomedica 2007;23:116–9.
2. Schappert SM. Ambulatory care visits to physician offices, hospital outpatients and emergency departments: United States, 1996 National Center for Health Statistics. Vital Health Statistics 1998;134:1–37.
3. Najeeb R, Awan AS, Bakhtiar U, Akhter S. Role of TVS in assessment of abnormal uterine bleeding in perimenopausal age group. J Ayub Med Coll Abbottabad 2010;22:87–90.
4. Ozdemir S, Celik C, Gezginc K, Kiresi D, Esen H. Evaluation of endometrial thickness with transvaginal sonography and histopathology in premenopausal women with abnormal vaginal bleeding. Arch Gynaecol Obstet 2010;282:395–9.
5. Imran S, Musonda P, Ewies AA. Premenopausal bleeding: when should the endometrium be investigated? A retrospective non comparative study of 3006 women. Eur J Obstet Gynecol Reprod Biol 2010;148:86–9.
6. Takreem A, Danish N, Razzaq. Incidence of endometrial hyperplasia in 100 cases presenting with polymenorrhagia/ menorrhagia in perimenopausal women. J Ayub Med Coll Abbotabad 2008;21:60–3.
7. Fleischer AC, Kalemeris GC, Machin JE, Entman SS, JamesAE Jr. Sonographic depiction of normal and abnormal endometrium with histopathologic correlation. J Ultrasound Med 1986;5:445–52.
8. Smith Brindman R, Kerlikowske K, Felstein VA, Subak L, Scheidler J, Segal M, *et al*. Endovaginal ultrasound to exclude endometrial cancer and other endometrial abnormalities. JAMA 1998;280:1510–7.
9. Aslam M, Ijaz L, Tariq S, Shafqat K, Mehr-un-Nisa, Ashraf R *et al*. Comparison of TVS and saline contrast sonohysterography in women with AUB: Correlation with hysteroscopy and histopathology. Int J Health Sci Qassim Univ 2007;1:17–24.
10. Balic D, Balic A. Office hysteroscopy, transvaginal ultrasound and endometrial histology: a comparison in infertile patients. Acta Medica Academica 2011;40:34–8.
11. Dubinsky TJ, Parvey HR, Maklad N. The role of transvaginal sonography and endometrial biopsy in the evaluation of peri and postmenopausal bleeding. AJR Am J Roentgenol 1997;169:145–9.
12. Fleischer AC. Sonographic assessment of endometrial disorders. Semin Ultrasound CT MR 1999;20:259–66.
13. Bree RL, Bowerman RA, Bohm-Velez M, Benson CB, Doubilet PM, DeDreu S, *et al*. US evaluation of the uterus in patients with postmenopausal bleeding: a positive effect on diagnostic decision making. Radiology 2000;216:260–4.
14. Davis PC, O'Neill MJ, Yoder IC, Lee SI, Mueller PR. Sonohysterographic findings of endometrial and subendometrial conditions. Radiographics 2002;22:803–16.
15. Farguhar C, Ekeroma A, Furness S, Arroll B. A systematic review of TVS, SHS and hysteroscopy for the investigation of abnormal uterine bleeding in premenopausal women. Acta Obstet Gynecol Scand 2003;82:493–504.

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