Original Article

Diagnostic Accuracy of Transvaginal Ultrasonography for Endometrial Carcinoma Among Women Presented with Post-Menopausal Bleeding

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Abstract

Objective: To determine the diagnostic accuracy of transvaginal ultrasonography for endometrial carcinoma among women presented with menopausal bleeding.

Methodology: This cross sectional study took place at Obstetrics and Gynaecology Department of Lady Aitchison Hospital, Lahore. All females underwent TVS for assessments of endometrial thickness were included. Endometrial cavity examination was done from (internal os to fundus) in both the coronal and the saggital planes. Biopsy specimens were taken by D&C and sent to Hospital pathology laboratory for histopathology and findings were compared with TVS. All this information was recorded on proforma. Data analysis was done using SPSS 20.

Results: The patients' mean age was 67.82±7.98 years. Mean duration of menopause was 11.55±7.74 years. Mean endometrial thickness on TVS was 5.56±3.27mm. 67% females had Endometrial thickness <4mm on TVS showing endometrial cancer as positive while 92 (33%) were negative. There were 185 (66%) females who had endometrial cancer as positive on histopathology while 92 (33%) were negative on histopathology. The sensitivity, specificity, NPV, PPV and diagnostic precision for TVS were calculated as 95.1%, 87.4%, 90.2%, 93.6% and 92.5%.

Conclusion: Thus according to results of this study, it is revealed that TVS is a good diagnostic tool and can rule out the problem of post-menopausal bleeding and prevent the patients from invasive procedures.

Key words: Transvaginal Ultrasonography, Post-Menopausal Bleeding, Histopathology, Endometrial Thickness, Endometrial Carcinoma

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Introduction

Postmenopausal bleeding (PMB) is characterized as any genital tract bleeding occurring above 12 months following last menstrual cycle or it is also defined as if female continues to menstruate after 55 years of age. PMB is by far the commonest symptom of carcinoma of endometrium .[1,2] Women with PMB are at 10 to 15% risk of endometrial cancer and thus malignancy can be excluded at diagnosis.[3] A recently study reported that 38% of PMB women were identified with endometrial carcinoma.[4] Using transvaginal ultrasonography (TVS) enables the health professional to classify females at endometrial carcinoma risk and evaluate them to a proper histologically established diagnostic procedure.[5]

But there are controversial results present in literature as some studies reported the sensitivity of TVS as 96-100%and specificity as 60-68%.[6,7] While another study

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reported specificity and sensitivity of TVS as 55.6% and 49.7% with≥4mm threshold.[8] Rationale of this study is to decide the diagnostic precision of transvaginal ultrasonography to diagnose endometrial malignancy in patients with postmenopausal bleeding considering histopathology as benchmark. Endometrial biopsy based on hysteroscopy is benchmark examination, however because the facilities are limited, such cases are evaluated mainly by Dilatation and Curettage (D&C). Literature is reporting that TVS is a dependable tool in diagnosing endometrial cancer, but there is also controversy in results. Through this study we want to clear this ambiguity. This study will also help to avoid unnecessary interventions and conservative approach can be followed afterwards. Corpus malignancy is a highly prevalent genital malignancy among females. About 40,100 corpus tumor cases were expected to emerge in the U.S. during 2008, rendering it the 4th most prevalent tumor in females; about 7,400 of such females will die because of this disease.[11] PMB applies to a uterine bleeding among menopausal females (apart from the cyclic bleeding occurring in females undergoing postmenopausal hormonal therapy). It represents approximately 5% of visits to gynecology office.[10] All postmenopausal females with unexplained uterine bleeding must be screened for endometrial sarcoma as this deadly disorder can trigger bleeding in about 10% cases (ranging between 1 and 25% based on risk factors).[11]

Though, endometrial or vaginal mucosal atrophy is the commonest trigger of bleeding among such females.[12] Following menopause, bleeding could be a symptom of uterine cancer. The most prevalent form of uterine sarcoma is endometrial tumor. While the true source of endometrial tumor is unclear, there seems to be a reason for elevated estrogen levels. It serves to promote the development of the uterus lining. Research have demonstrated that premature endometrial sarcoma and carcinoma derive from elevated estrogen levels among animals. Most endometrial sarcoma cases arise at the age of 60 to 70 years, however some cases can possibly take place prior to the age of 40 yrs.[13-16]

The current study aims at finding out how accurately the TVS assessment of endometrial thickness, in patients of PMB can help to detect the presence of malignancy.

Methodology

The present cross sectional study took place at Unit IV, Department of Obstetrics and Gynecology, Lady Aitchison hospital, Lahore from 2014 to 2015. Patients of age 55-80 years with post-menopausal bleeding undergoing hysterectomy and endometrial biopsy for histopathology were included. Patient already taking Hormonal replacement therapy and patients with history of Chemotherapy/surgical/radiation and induced menopause were excluded. After taking ethical approval, informed consent was taken from each patient.

Demographic details were obtained. All the females underwent TVS for assessment of endometrial thickness by radiologist having experience more than 5 years. Endometrial cavity examination was done (internal os to fundus) in both the coronal and the sagittal planes. Specimens were taken from all women by D&C and samples were sent to Hospital pathology laboratory for histopathology. All this information was recorded on self-made proforma. All the data was analyzed through SPSS version 20. Standard deviation and mean were calculated for the quantitative variables including age and endometrial thickness. Frequencies and percentages were calculated for the qualitative variables like parity and endometrial carcinoma on TVS and histopathology. 2x2 tables were developed for the calculation of specificity, sensitivity, NPV, PPV and TVS diagnostic precision in endometrial carcinoma diagnosis taking histopathology as benchmark.

Results

In this study 280 females were studied, their mean age was 67.82±7.98 years. 6.1% females were nulliparous, 45.7% females had parity 1-4, while 48.2% females had parity 5-9. (Figure 1) Mean duration of menopause was 11.55±7.74 years. Mean endometrial thickness on TVS was 5.56±3.27mm. (Table I)

Out of all study participants 67% females had endometrial thickness ≥4mm on TVS remaining 33% had endometrial thickness ≥4mm. (Table II)

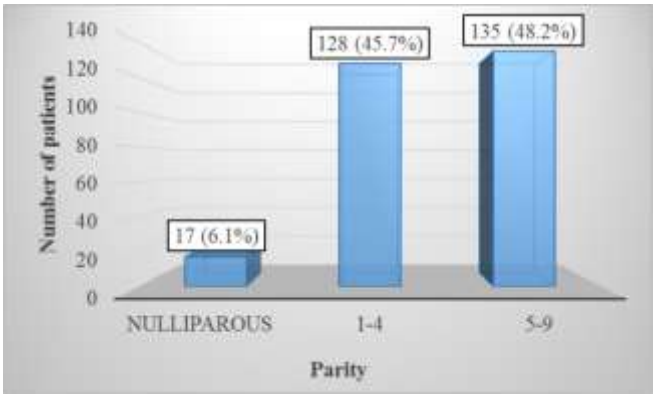

Figure 1. Distribution of females according to

Table I: Descriptive statistics of age, parity and endometrial thickness of patients (n=280)			
Variable	**Mean±SD**	**Minimum**	**Maximum**
Age (Years)	67.82±7.98	55	80
Duration of menopause (Years)	11.55±7.74	1	25
Endometrial thickness (mm)	5.56±3.27	1	12

According to the histopathology 66% females had endometrial carcinoma, while 33% were without endometrium carcinoma, based on histopathology.

The sensitivity, specificity, PPV, NPV and diagnostic accuracy of TVS were calculated as 95.1%, 87.4%, 93.6%, 90.2% and 92.5%. (Table III)

Table II: Diagnostic accuracy of TVS for endometrial cancer taking histopathology as gold standard				
		Histopathology		**Total**
		Positive	**Negative**	
TVS	**>4mm**	176 (95.1%)	12 (12.6%)	188 (67.1%)
	<4mm	9 (4.9%)	83 (87.4%)	92 (32.9%)
Total		185 (100%)	95 (100%)	280 (100%)

Table III: Sensitivity, specificity, PPV, NPV and diagnostic accuracy of TVS	
Sensitivity	95.1%
Specificity	87.4%
PPV	93.6%
NPV	90.2%
Diagnostic accuracy	92.5%

Discussion

Endometrial carcinoma occurs as a non-specific endometrial thickening, which is challenging to differentiate from a polyp or hyperplasia, unless there is a myometrial intrusion. Endometrial cancer is generally diagnosed on curettage or endometrial biopsy basis, frequently performed during hysteroscopy.[19,20] TVS' primary function is to reliably determine endometrial thickness among PMB cases. Ultrasound is readily available, which without ionizing radiations has a high NPV and promotes the evaluation of post-menopausal women in lower and higher-risk categories. Ultrasound is highly sensitive in determining if the endometrium is anomalous however with a poor specificity as benign scenarios can as well induce endometrial thickness.[21]

As a non-invasive diagnostic procedure for endometrial pathology, TVS are employed effectively as a primary examination in the AUB administration. When it comes to focal lesions such as fibroids, foreign body or polyps, the rate of diagnosis of a pathological malignancy by ultrasonography is high. D&C as a blind surgery involves hospital admission as well as general anesthesia that can be substituted reliably by an alternative valid, non-invasive and safe procedure to evaluate endometrial pathology of AUB females.[22]

In our study, 280 females were included with PMB, with a mean age of 67.82±7.98 years. There were 17 (6.1%) females who were nulliparous (no child delivery during reproductive age), 128 (45.7%) females had parity 1-4 while 135 (48.2%) females had parity 5-9.The mean duration of menopause was 11.55±7.74 years.

We applied TVS on all females and observed that mean endometrial thickness on TVS was 5.56±3. 27mm.There were 188 (67%) females who had Endometrial thickness ≥4mm on TVS showing endometrial cancer as positive, while 92 (33%) were negative.

In our study, all females underwent D&C for histopathological confirmation of results as reported by TVS and found that there were 185 (66%) females who had endometrial cancer as positive on histopathology, while 92 (33%) were negative on histopathology.

TVS with concurrent TV-UCD seems to be a low-cost, easy-to-perform and repetitive procedure for an especially deep myometrial intrusion. due to its higher expenses and tedious process, if TVS has a poor quality, MRI could be advised. Since it may result in inadequate treatment plans based entirely on diagnostic procedures, intraoperative frozen portion must also be conducted for myometrial evaluation.[23] The specificity, sensitivity, NPV, PPV, and TVS diagnostic precision were calculated as 87.4%, 95.1%, 90.2%, 93.6% and 92.5%.Many studies reported the sensitivity of TVS as 96-100%and specificity as 60-68%.[6,7]

Olaya et al., reported that the TVS in thickness of endometrium had sensitivity of 94.1%, and specificity of 84.8%, with a general accuracy of 88%. These results are comparable to those documented for the general accuracy of TVS in the literature.[23] But Litta et al., reported a specificity and sensitivity of TVS as 49.7% and 55.6% with≥4mm threshold.[8] Akbayir et al, also reported specify, sensitivity, NPV, PPV as well as overall

TVS diagnostic precision in assessment of the myometrial infiltration depth as 82%, 68.4%, 84.1%,65.1% and 77.5%, respectively. In predicting cervical involvement, TVS may be deemed as an economical , feasible and easy imaging procedure with strong diagnostic reliability. Though, in evaluating the myometrial infiltration depth, it is an unreliable approach.[24] Taskin et al, reported that with 6 mm of cut-off level for thickness of endometrium, TVS has sensitivity of 96.4% and specificity of 60.0%.[25]

Conclusion

The results of current study revealed a good reliability of TVS as prediction tool for endometrial cancer resulting from PMB. The controversy has been resolved. It can help us to rule out the problem of post-menopausal bleeding and prevent the patients from invasive procedures. So in future, we will recommend the assessment of cause of PMB on TVS instead of going for interventional method like D&C.

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