DOI: https://doi.org/10.53350/pjmhs2023173145

ORIGINAL ARTICLE

Prediction of Endometrial Pathology by Endometrial Cut-Off Thickness in Patients with Abnormal Uterine Bleeding

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ABSTRACT

Aim: To determinecut-off endometrial thickness for prediction of endometrial pathology in patients with abnormal uterine bleeding.
Study design: Cross-sectional study
Place and duration of study: Department of Obstetrics & Gynaecology, Niazi Medical & Dental College, Sargodha from 1st October 2021 to 30th September 2022.
Methodology: Seventy perimenopausal women who were above the age of 40 years and were suffering from acute urinary bleeding were enrolled. Transvaginal ultrasound was conducted. Uterus as well as adnexa were scanned longitudinally ad transversally. Doppler was activated and hemodynamic-parameters were bilaterally examined from the main dominant uterine arteries branch to the cervical-corporal section of uterus. Endometrial vessels color flow examination detected number, size, as well as vessel regularity of branching. Three different vascular patterns were observed.
Results: The mean age of the women in Group I was 44.25 ± 2.69 years where as in Group II cases it was mean 47.16 ± 3.25 years. Transvaginal ultrasound endometrial thickness cut-off was determined as >10.5mm. Comorbidities were higher in the Group II with neoplastic changes observed. The value of obesity, age, hypertension and diabetes as well as endometrial thickness >10.5 were significantly higher in mltivariant analysis whereas age, obesity and ET>10.5 was increased in the univariate analysis as well. Transvaginal ultrasound-endometrial thickness >10.5mm was having highest value of sensitivity and specificity
Conclusion: Perimenopausal women suffering with abnormal uterine bleeding should undergo histopathological examination if they have a transvaginal ultrasound-endometrial thickness value greater than 10.5mm.The main risk factors towards increased risk of endometrial pathology development are age and obesity.
Keywords: Abnormal uterine bleeding, Endometrial carcinoma, Histopathology

INTRODUCTION

The preliminary signs of perimenopausal are observed through irregularity in the menstrual cycle.[1] It is also referred to late years of reproductive cycle which is initiated somewhere between late 40s or early 50s. There is a gradual reduction in the ovarian follicles which consequently is caused by the decrease in the oestradiols. The overall decrease in the hormonal profiling results in the prolonging of amenorrhea and or heavy menstrual bleeding.[2] Perimenopausal cases with abnormal uterine bleeding (AUB) may present with spectrum of menstrual disorders[3].

There has been a wide advancement in the diagnosis of the AUB starting from the application of curettage as well as traditional dilation to immune-histochemical markers and transvaginal ultrasound (TVS). Other tests as colored doppler, hysteroscopy or and sono-salpingography are also very significant in the diagnosis of AUB. There is a variance in acceptance f the patients in context with invasive and non-invasive technical approaches. Non-invasive techniques are more preferred by the patients than invasive techniques. TVS is a reliable and efficient procedure which is accepted by clinicians as well as the patients themselves.[4] The new evolving techniques for the assessment of the endometrial thickness has provided a significance identification level for neoplasticor any benign endometrial lesions presented in women of any age[5].

The application of transvaginal ultrasonography endometrial thickness as an initial screening technique is found useful in predicting the endometrial thickness cut-off values. This can be used for proposing and ruling out the endometrial pathological changes.[6] There is a range of endometrial strip-cut-off thickness from 3 to 14mm.[7,8] However, there is a very less data available in determining the cut-off of endometrial thickness in perimenopause women.[9,10] The present study was designed to provide an in-depth insight in the aforementioned. This would assist in perimenopausal women suffering from AUB to choose the offer for an invasive endometrial sampling requirement or not at priority basis.

Received on 19-10-2022
Accepted on 13-02-2023

MATERIALS AND METHODS

This cross-sectional study was carried out at Department of Obstetrics & Gynaecology, Niazi Medical & Dental College, Sargodha from 1st October 2021 to 30th September 2022. Seventy perimenopausal women who were above the age of 40 years and were suffering from acute urinary bleeding were enrolled. Those women who were diagnosed with ovarian tumor, tubo-ovarian mass formation, malignancies related with the genital were not included in this study. Women having any kind of drugs which can affect the blood flow of pelvis were also excluded from the research. The sample size was calculated based on 95% CI and 80% power of test (WHO sample size calculator). A complete examination involving gynaecological investigation as well as preliminary transvaginal ultrasound was conducted within 8-11 day of menstrual cycle. In patients with uncontrollable uterine bleeding anti-fibrinolytic drugs was administered pre-examination. This subject those for sonographic assessment post 8 days but no later than 11 days. A vaginal probe with frequency -10 mega hertz was opted identifying uterine morphology, size, contour and Doppler-flow pattern of endometrial vessels. Uterus as well as adnexa were scanned longitudinally ad transversally. Any related abnormality was highlighted. On magnification of the uterus images on sagittal plane (longitudinal) the endometrial thickness was measured. Echo-free space was excluded. Doppler was activated and hemodynamic-parameters were bilaterally examined from the main dominant uterine arteries branch to the cervical-corporal section of uterus. Endometrial vessels color flow examination detected number, size, as well as vessel regularity of branching. Three different vascular patterns were observed as single, scattered and multiple vessel for endometrial polyp, endometrial hyperplasia and endometrial carcinoma respectively. Endometrial sampling was conducted post ultrasound at different distinct levels depending on menstrual bleeding pattern during 25 to 27 days within pre-menstrual time in cyclic bleeding patients. In cases with atypical bleeding the sampling was done immediate after post-menstruation. Sampling was performed empty bladder under aseptic conditions using Sims bivalve vaginal-speculum.

Endometrial sample was aspirated through Carmen's-cannula (No.4) and referred for histopathological investigation preserved in 10% of formalin. The women were assigned as Group I and Group II based on their diagnosis as Group I were those with normal diagnosis on histopathological examination while in Group II were those with neoplastic histology. Data was analyzed through SPSS version 25.0. Univariate and multivariate logistic regression as well as odds ration were used tests for analysis of the results. P value <0.05 was taken significant.

RESULTS

Group I were those with normal diagnosis on histopathological examination were 50 in number (71.42%) while in Group II 20 cases (28.57) were those with neoplastic histology. The mean age of the women in Group I was 44.25 ± 2.69 years where as in Group II cases it was mean 47.16 ± 3.25 years. TVS-ET cut-off was determined as >10.5mm. Comorbidities were higher in the Group II with neoplastic changes observed. The BMI of Group II as well as transvaginal ultrasonography endometrial thickness (TVS-ET) value was also significantly higher within Group II (Table 1).

The uni-variate as well as multivariate logistic regression-based analysis presented various factors or the prediction of endometrial pathology. The value of obesity, age, hypertension and diabetes as well as ET>10.5 were significantly higher in multivariant analysis whereas age, obesity and ET>10.5 was increased in the univariate analysis as well (Table 2).

The endometrial thickness (ET) was measured as 7.90 ± 2.63 mm and as 14.08 ± 3.98 mm, respectively. TVS-ET >10.5mm was having highest value of sensitivity and specificity (89.6% and 86.4%). The RCO curve gives a clear presentation of maximum Youden's index (sensitivity + specificity - 1) value (Fig. 1). The area under curve (AUC) was as0.920 with 95% confidence intervals and having values as 0.846 to 0.994, (*P*<0.0001). It has 70.69%, positive predictive value and 95.69% as negative predictive value.

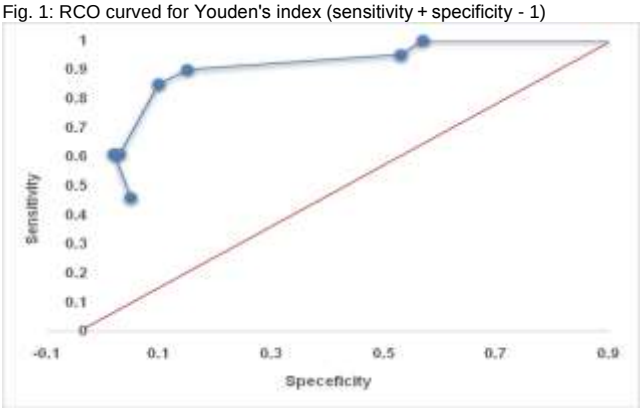
Table 1: Characteristics enrolled patients

Variable	Group I (*n* = 50)	Group II (*n* = 20)	*P* value
Age	44.25±2.69	47.16±3.25	0.000
Parity	2.89±1.48	2.75±1.35	0.690
HTN present	6 (11.76%)	4 (21.05%)	0.323
Obesity	7 (13.72%)	8 (42.10%)	0.010
Diabetes	5 (9.80%)	4 (21.05%)	0.211
BMI	22.56±4.09	23.68±4.65	0.330
Mean TVS-ET	7.89±2.62	14.07±3.96	0.000
Mean RI values	0.89±0.06	0.86 0.06	0.084
Mean PI values	2.11±0.03	2.08±0.09	0.065

Table 2: Comparison of Group I and Group II through uni- and multi-variant regression analysis

Variable	Group I (*n* = 50)	Group II (*n* = 20)	*P* value (univariate)	OR	*P* value (multivariate)	OR
Age >45	20 (40%)	15 (73%)	0.015	3.96 (1.26–10.13)	0.06	4.83(1.03-22.84)
Obesity (BMI ≥30)	7 (14%)	8 (42%)	0.011	4.57 (1.37–15.39)	0.03	4.24(0.83-21.61)
HTN*	6 (12%)	4 (21%)	0.322	0.51 (0.13–2.11)	—	—
Diabetes*	4 (9%)	4 (21%)	0.212	2.46 (0.59–10.31)	—	—
ET >10.5	13 (27%)	16 (80%)	0.000	26.79 (5.57–44.49)	0.004	22.61 (1.92–47.94)

Fig. 1: RCO curved for Youden's index (sensitivity + specificity - 1)



DISCUSSION

Histopathological evaluation of the endometrium is considered as a general method for the identification of AUB causing agents specifically in women above the age of 45 years, although there may not be a need for histopathological examination in all women with AUB but only in those having an increased risk of hyperplasia or malignancies.[11] The present study was conducted for evaluating the cut-off values of endometrial thickness for prioritizing the AUB perimenopausal women and provide useful information for better health plans of these women[12-14].

The current study results presented data where perimenopausal women having obesity and a cut-off value above 10.5mm of TVS-ET were more prone towards abnormal uterine bleeding. The critical endometrial thickness value as predicted cut-off in this study was with a sensitivity and specificity of 89.6% and 86.4%. Similar results have been proposed in other research[15,16] as well which further promotes the reliability of the present study results. Doppler-flow velocimetric analysis of endometrial as well as uterine vessels does not accompaniment its diagnostic assessment[17].

The relevance of age is a highlighted factor in terms of AUB in various societies including American College of Obstetricians and Gynecologists and also in the National Institute for Health and Care Excellence. The women suffering from AUB having higher age are prioritized for the endometrial biopsy[15-18].

There are few studies which have detailed the cut-off values for endometrial thickness in perimenopausal women suffering from AUB. Mayuri et al[18] elaborated about sensitivity, specificity, and probability, non-probability values as 90.9%, 87.5%, 80%, 94.5%, respectively in their research. The cut-off value, they defined in their research was greater than 8mm. The results were in close coordination with the current study findings. Another study has also specified similar cut-off values. However other research article has also elaborated ≥7 mm to be the cut-off value for endometrial thickness[19,20].

CONCLUSION

Perimenopausal women suffering with AUB should undergo histopathological examination if they have a TVS-ET value greater than 10.5mm. The main risk factors towards increased risk of endometrial pathology development are age and obesity.

Conflict of interest: Nil

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