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WOMEN OF REPRODUCTIVE AGE PRESENTING WITH ENDOMETRIAL HYPERPLASIA AND THE IMPORTANCE OF TRANSVAGINAL ULTRASOUND FOR DIAGNOSIS

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ABSTRACT

Endometrial hyperplasia is a common gynecological condition affecting women of reproductive age, characterized by abnormal proliferation of the endometrial glands relative to the stroma [4]. The condition carries significant clinical implications, including chronic anemia due to persistent or heavy uterine bleeding, infertility, and an increased risk of progression to atypical hyperplasia or endometrial carcinoma. Early detection is critical to prevent these adverse outcomes, and transvaginal ultrasonography (TRUS) has emerged as a key non-invasive diagnostic modality [8]. TRUS enables detailed assessment of endometrial thickness, echotexture, and structural heterogeneity, with endometrial thickness measurements exceeding 10–12 mm in the proliferative phase considered suspicious for hyperplastic changes [2]. High-resolution ultrasonography further facilitates identification of cystic spaces, focal lesions, and heterogeneous patterns that may indicate atypia. The integration of color Doppler imaging allows evaluation of endometrial vascularity, which has been associated with the severity of hyperplasia and potential malignant transformation [5].

Such imaging findings guide clinicians in selecting patients for confirmatory endometrial biopsy, which remains the definitive method for histopathological diagnosis and subtype differentiation. Histological classification differentiates simple and complex hyperplasia, with or without atypia, which is essential for risk stratification and management planning. Non-atypical hyperplasia often responds well to progestin therapy, whereas atypical forms may require more aggressive interventions, including levonorgestrel-releasing intrauterine systems (LNG-IUS), hysteroscopic resection, or close surveillance to reduce recurrence and prevent progression to carcinoma [1]. Factors such as obesity, polycystic ovary syndrome (PCOS), and unopposed estrogen exposure further influence both the development and recurrence risk of endometrial hyperplasia, emphasizing the importance of individualized treatment approaches [6].Incorporating TRUS into routine diagnostic workflows

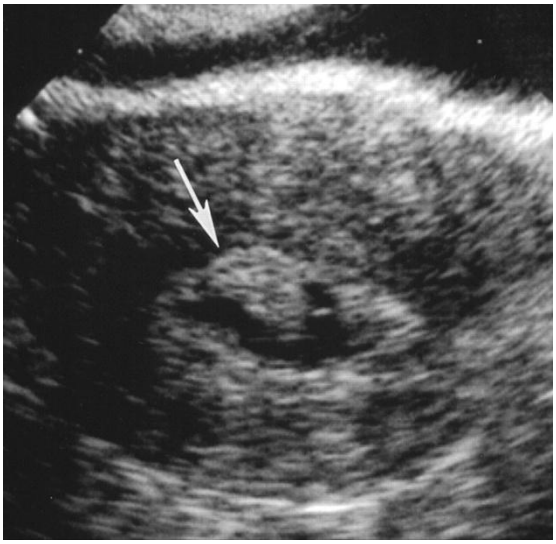
enhances early detection and allows for detailed evaluation of endometrial morphology before invasive procedures. TRUS provides valuable guidance for biopsy site selection, particularly in patients with focal lesions or heterogeneous endometrial patterns, improving diagnostic accuracy while minimizing unnecessary interventions. The combination of ultrasonographic findings with patient age, risk factors, and clinical history allows for comprehensive risk assessment and tailored management strategies [8].Overall, endometrial hyperplasia represents a significant reproductive health concern. The use of TRUS not only facilitates non-invasive evaluation and early detection but also supports effective clinical decision-making, targeted therapy, and improved patient outcomes [7]. Enhanced imaging techniques, coupled with individualized hormonal or surgical interventions, contribute to optimized management and reduced progression to malignancy. This underscores the essential role of TRUS as a reliable diagnostic tool for assessing endometrial hyperplasia in women of reproductive age [6].

Purpose. To evaluate the role and diagnostic value of transvaginal ultrasound in detecting endometrial hyperplasia in women of reproductive age.

Material and methods. This observational study included 60 women of reproductive age diagnosed with endometrial pathology. The age of the participants ranged from 18 to 45 years. The mean age of the study population was 30 years, wich falls within the 26-35 years age group. For comparative analysis, the patients were divided into three age groups: Group 1 (18–25 years, n = 12), Group 2 (26–35 years, n = 28), and Group 3 (36–45 years, n = 20).

All patients underwent a comprehensive clinical assessment, including detailed medical history, evaluation of menstrual cycle characteristics, and general physical examination. Particular attention was given to body weight, blood pressure, and associated conditions such as polycystic ovary syndrome (PCOS) and metabolic disorders. Information regarding lifestyle factors and previous hormonal therapy was also collected. Transvaginal ultrasonography (hereafter referred to as TRUS) was performed in all patients using a 5 MHz probe. The endometrium was evaluated in a standardized manner. Endometrial thickness was measured in the sagittal plane, and values exceeding 12 mm were considered abnormal. Echogenicity was assessed as homogeneous or heterogeneous. Color Doppler imaging was used when indicated to assess vascularity and intralesional blood flow. All TRUS findings were systematically documented for further comparison with histopathological results. Endometrial biopsy was performed using a Pipelle catheter in patients with abnormal TRUS findings. In selected cases, hysteroscopy (Karl Storz system) was carried out to improve visualization of the uterine cavity and to obtain targeted biopsy samples from suspicious areas. Laboratory investigations included complete blood count (CBC), fasting blood glucose, and hormonal analysis, measured using standard ELISA methods. Treatment strategies were

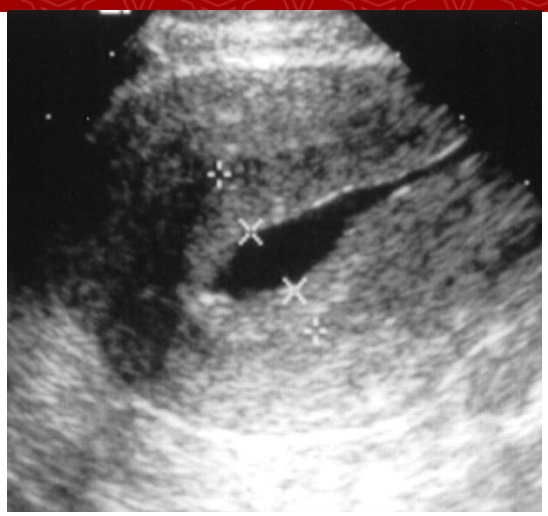
individualized based on patient age, body mass index (BMI), blood pressure, and comorbidities. Data analysis was performed to evaluate differences across the three age groups, focusing on ultrasonographic findings, including endometrial thickness, echostructure, focal lesions, and vascularity patterns, as well as histopathological outcomes (normal endometrium, hyperplasia, and atypical hyperplasia or carcinoma). Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Descriptive and comparative analyses were applied to assess the relationship between age, TRUS findings, and pathological outcomes.



Results. A total of 60 women of reproductive age were included in this retrospective observational study. Among them, 45 patients (75.0%) were diagnosed with endometrial hyperplasia, 5 patients (8.3%) with endometrial cancer, and 10

The mean age of the study population was 34.9 ± 6.7 years (range, 18–45 years). Figure 1. A 28-year-old patient (Z) was found on ultrasound to have a hypoechoic, heterogeneous mass in the endometrium of the uterus; histological examination confirmed endometrial carcinoma.

1. Patients were stratified into three age groups: Group 1 (18–25 years, 20.0%), Group 2 (26–35 years, 46.7%), and Group 3 (36–45 years, 33.3%). The highest prevalence of endometrial pathology was observed in the 26–35 years age group. Abnormal uterine bleeding (AUB) was the most frequent clinical presentation, reported in 41 patients (68.3%), followed by heavy menstrual bleeding in 18 patients (30.0%), intermenstrual bleeding in 13 patients (21.7%), and prolonged cycles in 10 patients (16.7%). Infertility was documented in 16 patients (26.7%), either primary or secondary. Risk factor analysis demonstrated that polycystic ovary syndrome (PCOS) was present in 18 patients (30.0%), obesity in 15 patients (25.0%), and type 2 diabetes mellitus in 8 patients (13.3%). Multiple metabolic-hormonal risk factors were identified in 20 patients (33.3%), with a higher proportion observed among patients with atypical hyperplasia and endometrial cancer. Transvaginal ultrasonography (TRUS) revealed increased endometrial thickness in most patients with pathology, with a mean value of 13.2 ± 3.4 mm. Endometrial thickness exceeding 15 mm was observed in 18 patients (30.0%), predominantly in the 36–45 years age group. Heterogeneous echotexture was detected in 28 patients (46.7%), while cystic changes were noted in 12 patients (20.0%).



2. Figure 2. A 34-year-old patient (Y) was found on ultrasound to have a hypoechoic, heterogeneous mass in the endometrium of the uterus; histological examination confirmed endometrial carcinoma.

However, in 10 patients (16.7%) with histologically confirmed normal endometrium, TRUS initially raised suspicion of mild endometrial thickening or structural irregularity, leading to further evaluation. Due to inconclusive or borderline TRUS findings in a subset of cases, 12 patients (20.0%) were referred for additional magnetic resonance imaging (MRI) to improve diagnostic clarification. Among these, 6 cases were finally confirmed as normal endometrium, while 4 were consistent with simple hyperplasia and 2 required follow-up due to suspicious but non-confirmatory imaging features. Histopathological examination confirmed simple hyperplasia without atypia in 20 patients (33.3%), complex hyperplasia without atypia in 15 patients (25.0%), atypical hyperplasia in 10 patients (16.7%), and endometrial cancer in 5 patients (8.3%). A progressive increase in atypical lesions and malignancy was observed with advancing age. Correlation analysis demonstrated that patients with atypical hyperplasia or cancer more frequently presented with severe AUB and infertility. Among the 16 patients with infertility, 7 cases (43.8%) were associated with atypical pathology or malignancy. Obesity and PCOS showed a strong association with advanced endometrial pathology. Among obese patients, 9 of 15 (60.0%) had atypical hyperplasia or cancer, compared to 6 of 45 (13.3%) in non-obese patients ($p < 0.01$). Similarly, PCOS patients demonstrated a higher rate of atypical changes (38.9%) compared to non-PCOS patients (19.0%). Endometrial thickness was significantly higher in patients with atypical hyperplasia and cancer (15.5 ± 3.6 mm) compared to non-atypical hyperplasia (12.3 ± 2.9 mm) and normal endometrium (9.0 ± 1.4 mm). Follow-up data were available for 40 patients receiving progestin therapy. Regression of hyperplasia was observed in 22 patients (55.0%), mainly in non-atypical cases, while persistent or progressive disease was noted in 7 out of 13 patients (53.8%) with endometrial cancer. Overall, TRUS demonstrated high diagnostic utility in initial assessment; however, a proportion of cases with subtle or non-specific findings required MRI for clarification, particularly in patients initially categorized as normal or borderline on ultrasound. This highlights the importance of combining imaging modalities with histopathological confirmation for accurate diagnosis and appropriate management of endometrial

histopathology in reproductive-aged women. Table 1 Distribution of histophatalogical findings among patients

Age group (years)	Total	Normal (%)	Hyperplasia (%)	Cancer(%)
18-25	12	3	8	1
26-35	28	3	20	5
36-45	20	4	17	3
Total	60	10	45	9

Conclusion. the results of this study confirm that transvaginal ultrasonography (TRUS) is an effective first-line method in the differential diagnosis of endometrial hyperplasia and endometrial carcinoma in women of reproductive age. Based on our findings, TRUS demonstrated a sensitivity of approximately 91.8%, specificity of 80.0%, and an overall diagnostic accuracy of 90.0% in detecting pathological endometrial changes. Out of 60 examined patients, TRUS successfully identified the majority of hyperplastic and atypical cases; however, a small number of diagnostic limitations were observed. In particular, 2 patients with histologically normal endometrium were incorrectly interpreted as having pathological changes on TRUS, reflecting false-positive findings. In addition, a limited number of cases with suspicious or inconclusive ultrasonographic features required further evaluation using advanced imaging techniques such as magnetic resonance imaging (MRI), which contributed to clarification diagnosis and exclusion of malignancy. Despite these limitations, TRUS provided reliable differentiation between normal endometrium, hyperplasia, and atypical or malignant changes in most cases. Its ability to assess endometrial thickness, structural heterogeneity, and vascular patterns played a key role in identifying high-risk patients and guiding timely biopsy. Overall, the study shows that TRUS is a practical, accessible, and sufficiently accurate diagnostic tool in routine gynecological practice. While it cannot completely replace histopathological confirmation, it significantly improves early detection and helps in clinical decision-making. In cases with uncertain findings, complementary imaging methods such as MRI remain important to ensure diagnostic precision and avoid misclassification.

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