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Diagnostic Evaluation of Endometrial Biopsy Among Peri and Postmenopausal Women with Abnormal Uterine Bleeding in a Tertiary Care Hospital

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ABSTRACT

Background: Abnormal uterine bleeding (AUB) is a common gynecological complaint in peri- and postmenopausal women and may reflect a wide spectrum of endometrial pathology ranging from benign hormonal changes to malignancy. Endometrial biopsy remains the gold standard for etiological diagnosis, particularly in resource-limited settings.

Objectives: To evaluate the histopathological patterns of endometrial lesions detected on endometrial biopsy among peri- and postmenopausal women presenting with abnormal uterine bleeding and to compare the distribution of benign, premalignant, and malignant lesions between these groups.

Methods: A hospital-based cross-sectional study was conducted over three months in a tertiary care hospital. A total of 150 peri- and postmenopausal women presenting with abnormal uterine bleeding were included using consecutive sampling. Endometrial biopsy specimens were processed routinely and stained with hematoxylin and eosin. Histopathological findings were categorized and compared between peri- and postmenopausal groups. Data were analyzed using descriptive statistics and the Chi-square test, with a p-value <0.05 considered statistically significant.

Results: Of the 150 women studied, 65 were perimenopausal and 85 were postmenopausal. Menorrhagia was the most common presentation among perimenopausal women, while postmenopausal bleeding predominated in the postmenopausal group. Disordered proliferative and proliferative endometrium were frequent findings in perimenopausal women, whereas atrophic endometrium was most common in postmenopausal women. Endometrial hyperplasia was identified in 15.3% of cases overall, and endometrial carcinoma in 7.3%, with higher proportions observed among postmenopausal women. Inadequate samples were more frequent in the postmenopausal group.

Conclusion: Endometrial biopsy is an effective diagnostic tool for evaluating abnormal uterine bleeding in peri- and postmenopausal women, enabling early detection of premalignant and malignant lesions and guiding appropriate clinical management.

Keywords: *Abnormal uterine bleeding; Endometrial biopsy; Perimenopausal; Postmenopausal; Endometrial hyperplasia; Endometrial carcinoma.*

INTRODUCTION

Abnormal uterine bleeding (AUB) is among the most frequent gynecological complaints encountered in clinical practice and constitutes a significant proportion of outpatient visits worldwide. It is estimated that up to one-third of women experience AUB at some point during their lifetime, with the burden disproportionately higher during the peri- and postmenopausal years. Beyond menstrual irregularity, AUB carries substantial clinical consequences, including chronic

anemia, impaired physical and psychosocial functioning, and increased healthcare utilization, and remains one of the leading indications for hysterectomy in many low- and middle-income countries.

In the Indian context, AUB represents a major public health concern and a common reason for referral to tertiary care hospitals. Factors such as delayed presentation, high prevalence of nutritional anemia, metabolic comorbidities, and limited access to specialized diagnostic facilities further complicate management. Several hospital-based studies from India and neighboring regions have demonstrated that a wide histopathological spectrum underlies AUB, ranging from physiological endometrial patterns to premalignant and malignant lesions [1,2]. Importantly, a significant proportion of women for Endometrial carcinoma are found to harbor lesions that could potentially have been identified earlier through endometrial sampling, highlighting gaps in timely diagnosis and risk stratification.

The clinical significance of AUB varies considerably with age and menopausal status. In perimenopausal women, bleeding abnormalities are commonly attributed to anovulatory cycles and fluctuating ovarian hormone levels, resulting in functional or benign endometrial changes. However, this transitional period is also characterized by prolonged estrogen exposure without adequate progesterone opposition, which predisposes to endometrial hyperplasia and, in a subset of women, malignant transformation. In contrast, postmenopausal bleeding is universally regarded as a red-flag symptom. Although benign causes such as endometrial atrophy and polyps are frequent, endometrial carcinoma must be excluded in all cases until definitively ruled out. Published literature indicates that approximately 5–10% of women presenting with postmenopausal bleeding are diagnosed with endometrial malignancy, underscoring the importance of prompt diagnostic evaluation in this population [3,4,5].

Histopathological evaluation of the endometrium remains the gold standard for determining the etiology of AUB. Despite advances in imaging modalities, including transvaginal ultrasonography and hysteroscopy, tissue diagnosis continues to be indispensable for differentiating benign, premalignant, and malignant conditions. Endometrial biopsy is a minimally invasive, cost-effective, and outpatient-based procedure that provides direct assessment of endometrial architecture and cellular morphology. Its utility is particularly relevant in resource-constrained settings, where access to advanced diagnostic tools may be limited. When adequate samples are obtained, endometrial biopsy plays a pivotal role in guiding clinical decision-making, including the need for surveillance, medical therapy, or surgical intervention.

Multiple studies have explored the histopathological patterns of endometrium in women with AUB. Kaleem et al. reported that proliferative and secretory endometrium predominated in perimenopausal women, while postmenopausal women more commonly exhibited atrophic endometrium, with a higher proportion of hyperplasia and carcinoma in the latter group [1]. Similar findings were observed in studies by Vijayaraghavan et al. and Husain et al., which emphasized the diagnostic yield of endometrial biopsy in identifying both benign and malignant lesions across different age groups [2,5]. However, these studies were largely retrospective or descriptive in nature and often did not directly compare peri- and postmenopausal women within the same clinical framework. Moreover, variability in study design, sample size, and regional demographics limits the generalizability of existing data.

A notable gap in the current literature is the paucity of prospective or systematically conducted cross-sectional studies from Indian tertiary care centers that specifically compare endometrial pathology patterns between peri- and postmenopausal women presenting with AUB using uniform histopathological criteria. Given the differences in hormonal milieu, clinical presentation, and malignant potential between these two groups, such comparative data are essential for refining diagnostic algorithms and optimizing patient management. Additionally, regional data are critical for informing clinicians about locally prevalent patterns of disease and for reinforcing evidence-based use of endometrial biopsy in routine practice.

In this context, the present study was undertaken in a tertiary care hospital setting to evaluate the histopathological spectrum of endometrial lesions among peri- and postmenopausal women presenting with abnormal uterine bleeding. By correlating clinical presentation with biopsy findings and comparing patterns across menopausal status, the study aims to contribute evidence on the diagnostic utility of endometrial biopsy and to support early identification of premalignant and malignant lesions.

MATERIALS AND METHODS

Aim

To evaluate the endometrium pathological changes in Peri and Postmenopausal patients with Abnormal Uterine Bleeding in a Tertiary Care Centre.

Study Design

This study was conducted as a hospital-based cross-sectional study.

Study Period
The study was carried out over a period of three months, commencing after obtaining approval from the Institutional Scientific Committee and the Institutional Ethics Committee.

Study Setting
The study was conducted in the Department of Pathology, Sri Venkateshwara Medical College, Tirupati in collaboration with the Department of Obstetrics and Gynecology at Government Maternity Hospital (GMH), Tirupati, a tertiary care hospital.

Study Population
The study population consisted of peri- and postmenopausal women presenting with abnormal uterine bleeding who attended the Gynecology outpatient department or were admitted during the study period.

Sample Size and Sampling Method
The sample size was calculated based on a reported prevalence of endometrial lesions of 3.1%, with a confidence interval of 95%. A total of 150 study participants were included. Consecutive sampling was employed, wherein all eligible peri- and postmenopausal women presenting with abnormal uterine bleeding during the study period were enrolled until the required sample size was achieved.

Inclusion Criteria
Perimenopausal and postmenopausal women presenting with abnormal uterine bleeding, including irregular menstrual cycles and heavy menstrual bleeding, were included in the study.

Exclusion Criteria
Women receiving anticoagulant therapy and those with known bleeding disorders were excluded from the study.

Endometrial Sampling Procedure
Endometrial samples were obtained using standard endometrial biopsy techniques as per departmental protocol. The collected tissue specimens were immediately fixed in 10% neutral buffered formalin.

Histopathological Processing and Staining
The fixed endometrial tissue samples were subjected to routine paraffin tissue processing. Sections of 4–5 µm thickness were cut and stained with Hematoxylin and Eosin (H&E). All slides were examined under light microscopy by qualified pathologists, and histopathological diagnoses were rendered based on standard morphological criteria.

Definitions of Endometrial Pathology
Endometrial findings were categorized as proliferative endometrium, secretory endometrium, disordered proliferative endometrium, endometrial hyperplasia (with or without atypia), atrophic endometrium, endometrial polyp, and endometrial carcinoma based on histomorphological features observed on H&E-stained sections.

Morbidity Definition
Morbidity in the present study was defined as the presence of premalignant or malignant endometrial lesions, including endometrial hyperplasia and endometrial carcinoma, detected on histopathological examination.

Data Collection
Clinical details including age, menopausal status, and presenting symptoms were recorded. Histopathological findings were correlated with the clinical presentation to arrive at the final diagnosis.

Statistical Analysis
Data were entered into a spreadsheet and analyzed using JASP 0.18.3.0 statistical software. Categorical variables were expressed as frequencies and percentages. Comparative analysis between peri- and postmenopausal groups was performed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

RESULTS
A total of 150 women with abnormal uterine bleeding were included in the study, comprising 65 perimenopausal and 85 postmenopausal participants. The majority of perimenopausal women were in the 46–50-year age group, whereas most postmenopausal women were aged above 60 years (Table 1). Menorrhagia was the predominant presenting complaint among perimenopausal women (43.1%), while postmenopausal bleeding was the most common presentation in the postmenopausal group (68.2%) (Table 2). Histopathological evaluation of endometrial biopsy samples revealed disordered proliferative endometrium as the most frequent finding in perimenopausal women, whereas atrophic endometrium predominated among postmenopausal women (Table 3). Endometrial hyperplasia was identified in 15.3%

of cases overall, with a higher proportion observed in postmenopausal women; non-atypical hyperplasia constituted the majority of hyperplastic lesions (Table 4). Endometrial carcinoma was diagnosed in 7.3% of patients, predominantly of the endometrioid subtype, and was more frequent in the postmenopausal group (Table 5).

Table 1. Age Distribution of Study Participants by Menopausal Status (n = 150)

Age group (years)	Perimenopausal (n = 65)	Postmenopausal (n = 85)	Total n (%)
41–45	18	0	**18 (12.0)**
46–50	33	0	**33 (22.0)**
51–55	10	15	**25 (16.7)**
56–60	4	22	**26 (17.3)**
>60	0	48	**48 (32.0)**
Total	65	85	**150 (100)**

Table 2. Clinical Presentation of Abnormal Uterine Bleeding (AUB)

Clinical presentation	Perimenopausal (n = 65)	Postmenopausal (n = 85)	Total n (%)
Menorrhagia	28	0	**28 (18.7)**
Polymenorrhea	10	0	**10 (6.7)**
Intermenstrual bleeding	14	0	**14 (9.3)**
Postmenopausal bleeding	0	58	**58 (38.7)**
Spotting	8	12	**20 (13.3)**
Others	5	15	**20 (13.3)**
Total	65	85	**150 (100)**

Table 3. Histopathological Findings on Endometrial Biopsy (n = 150)

Histopathological diagnosis	Perimenopausal (n = 65)	Postmenopausal (n = 85)	Total n (%)
Disordered proliferative endometrium	20	11	**31 (20.7)**
Proliferative endometrium	14	0	**14 (9.3)**
Secretory endometrium	12	10	**22 (14.7)**
Atrophic endometrium	0	28	**28 (18.7)**
Endometrial polyp	5	7	**12 (8.0)**
Endometrial hyperplasia	10	13	**23 (15.3)**
Endometrial carcinoma	4	7	**11 (7.3)**
Inadequate sample	2	7	**9 (6.0)**
Total	65	85	**150 (100)**

Table 4. Distribution of Endometrial Hyperplasia by Type (n = 23)

Type of hyperplasia	Perimenopausal (n = 10)	Postmenopausal (n = 13)	Total n (%)
Non-atypical hyperplasia	8	9	17 (73.9)
Atypical hyperplasia	2	4	6 (26.1)
Total	**10**	**13**	**23 (100)**

Table 5. Histological Subtypes of Endometrial Carcinoma (n = 11)

Histological subtype	Perimenopausal (n = 4)	Postmenopausal (n = 7)	Total n (%)
Endometrioid carcinoma	3	6	9 (81.8)
Serous carcinoma	1	1	2 (18.2)
Clear cell carcinoma	0	0	0 (0)
Total	**4**	**7**	**11 (100)**

Figures

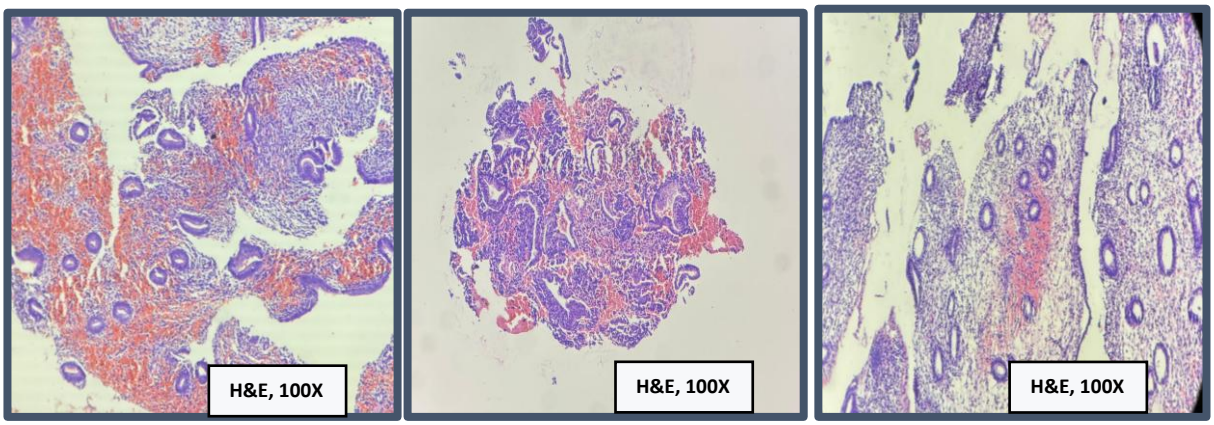

Figure 1: Histopathology of the Utrerus in a Peri Menopausal women in different phases A. Proliferative Phase; B. Secretory Phase; C. Disordered Proliferative Phase

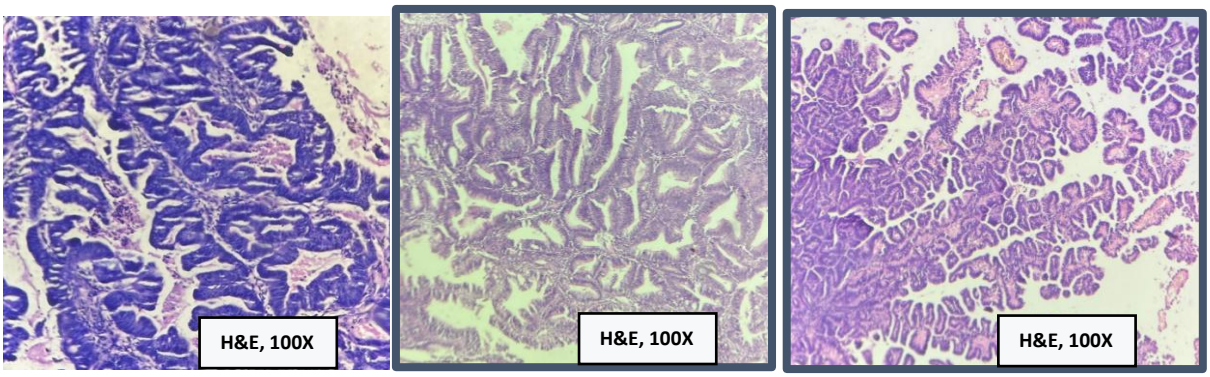

Figure 2: Histopathology of the Utrerus in a Post Menopausal women in different phases A. Atypical Hyperplasia ; B. Endometroid carcinoma ; C. Serous carcinoma

DISCUSSION

The present study evaluated the histopathological spectrum of endometrial biopsy findings among peri- and postmenopausal women presenting with abnormal uterine bleeding (AUB) in a tertiary care setting. Distinct patterns were observed between the two groups. Perimenopausal women were predominantly aged 46–50 years and most commonly presented with menorrhagia, reflecting hormonal imbalance during the transition to menopause. Histologically, proliferative, secretory, and disordered proliferative endometrium constituted the majority of findings in this group, indicating largely functional or hormonally mediated bleeding. Nevertheless, endometrial hyperplasia was identified in 15.4% of perimenopausal cases, and endometrial carcinoma was detected in 6.1%, underscoring that significant pathology may coexist even in apparently physiological AUB.

In contrast, postmenopausal women were predominantly above 60 years of age and most frequently presented with postmenopausal bleeding (68.2%). Atrophic endometrium was the most common histopathological finding (32.9%), consistent with hypoestrogenic changes after menopause. Importantly, endometrial hyperplasia (15.2%) and carcinoma (8.2%) were more frequent in postmenopausal women compared to the perimenopausal group. Inadequate biopsy samples were also more common in postmenopausal women, reflecting technical challenges related to a thin, inactive endometrium. Collectively, these findings reaffirm the diagnostic value of endometrial biopsy in both age groups, while highlighting the higher malignant potential associated with postmenopausal bleeding.

Comparison with Indian Studies

The findings of the present study are largely concordant with previously published Indian hospital-based studies evaluating endometrial pathology in women with AUB. Pidigundla et al. reported endometrial hyperplasia in 8.5% and carcinoma in 1.4% of women undergoing endometrial biopsy, with an inadequacy rate of 7.1% (6). Compared to this, the present study demonstrated a higher overall prevalence of hyperplasia (15.3%) and carcinoma (7.3%). This difference may be attributed to the deliberate inclusion of a substantial proportion of postmenopausal women, who inherently carry a higher risk of malignant pathology.

Shrestha et al., in a South Asian tertiary care setting, observed endometrial hyperplasia in 3.8% and carcinoma in 1.2% of cases, with inadequate samples in 6.3% (7). These lower figures compared to the present study likely reflect differences in age distribution, as their cohort included a larger proportion of reproductive-age women. In contrast, the present study

specifically focused on peri- and postmenopausal women, thereby enriching the sample for premalignant and malignant lesions.

An Indian study from Jharkhand focusing exclusively on postmenopausal bleeding reported hyperplasia in 12.4% and carcinoma in 11.1% of cases, with an inadequacy rate of 9.6% (8). These findings closely parallel the postmenopausal subgroup in the present study, where hyperplasia and carcinoma were observed in 15.2% and 8.2% of cases, respectively, and inadequacy was noted in approximately 8%. The similarity reinforces the reproducibility of these patterns across different Indian regions and supports the reliability of endometrial biopsy as a diagnostic tool in postmenopausal bleeding.

Singh et al. reported hyperplasia in 14.8% and carcinoma in 6.9% of AUB cases in a three-year retrospective study from India (9). These figures are nearly identical to those observed in the present study, further validating the consistency of the histopathological spectrum across Indian tertiary care centers.

Comparison with International Studies

International studies demonstrate comparable trends, although absolute prevalence rates vary depending on population characteristics and referral patterns. A study from Western Kenya involving peri- and postmenopausal women reported endometrial hyperplasia in 11.3% and carcinoma in 19.2% of cases (10). While the prevalence of hyperplasia was similar to the present study, the markedly higher carcinoma rate likely reflects delayed presentation and limited access to early diagnostic services in that setting. In contrast, the carcinoma prevalence of 7.3% in the present study suggests comparatively earlier evaluation and detection.

Husain et al., in a large 13-year retrospective study from Saudi Arabia, reported endometrial hyperplasia in approximately 12% and carcinoma in 5–6% of women with AUB (11). These findings are closely aligned with the present study, particularly in the postmenopausal subgroup, suggesting that despite geographic and ethnic differences, the fundamental relationship between menopausal status and endometrial pathology remains consistent.

The findings of the present study have important clinical implications. First, they reinforce that while perimenopausal AUB is often benign, a non-negligible proportion of women harbor premalignant or malignant lesions, justifying a low threshold for endometrial biopsy in this age group. Second, the higher prevalence of hyperplasia and carcinoma among postmenopausal women with bleeding strongly supports current recommendations that all cases of postmenopausal bleeding warrant endometrial evaluation.

CONCLUSION

The present study demonstrates that abnormal uterine bleeding in peri- and postmenopausal women encompasses a wide histopathological spectrum, ranging from functional endometrial changes to premalignant and malignant lesions. In perimenopausal women, the majority of cases were associated with benign or hormonally mediated patterns; however, a significant proportion showed endometrial hyperplasia and a small but notable incidence of carcinoma, indicating that clinically important pathology may be present even in this age group. Postmenopausal women exhibited a higher prevalence of endometrial hyperplasia and carcinoma, reinforcing postmenopausal bleeding as a high-risk symptom requiring prompt evaluation. The occurrence of inadequate samples, particularly among postmenopausal women, highlights the need for repeat or alternative sampling techniques when initial biopsies are inconclusive. Overall, endometrial biopsy proved to be a valuable and practical diagnostic tool for early detection and appropriate management of endometrial pathology.

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