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Original Research Article

HISTOPATHOLOGICAL SPECTRUM OF ENDOMETRIAL BIOPSIES IN WOMEN WITH ABNORMAL UTERINE BLEEDING: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Abnormal uterine bleeding (AUB) is one of the most common gynecological complaints across all age groups. Histopathological evaluation of endometrial biopsy remains the gold standard for identifying benign, premalignant, and malignant endometrial lesions and plays a crucial role in guiding clinical management.

Materials and Methods: This cross-sectional study was conducted in the Department of Pathology at a tertiary care center between August 2020 and December 2022. A total of 163 endometrial biopsy specimens from women presenting with AUB were included. Clinical details were recorded, and all specimens underwent routine histopathological examination using hematoxylin and eosin staining. Histopathological findings were analyzed according to age and categorized as benign or malignant.

Results: The mean age of the patients was 41.82 ± 9.59 years, with the highest proportion of cases occurring in the 40-to-49-year age group (50.9%). Menorrhagia was the most common presenting complaint (41.1%). Histopathological examination showed proliferative endometrium in 31.9% of cases, secretory endometrium in 23.3%, endometrial hyperplasia without atypia in 22.1%, disordered proliferative endometrium in 6.8%, endometrial polyp in 6.1%, hormonal imbalance in 3.7%, atypical endometrial hyperplasia in 1.8%, and endometritis in 1.2%. Adenocarcinoma was identified in five (3.1%) cases. Overall, 155 (95.1%) lesions were benign, while eight (4.9%) represented premalignant or malignant pathology.

Conclusion: Most endometrial lesions associated with AUB were benign, with proliferative endometrium being the predominant histopathological finding. However, premalignant and malignant lesions were observed, particularly in peri and postmenopausal women. Endometrial biopsy remains an essential diagnostic tool for early detection of significant pathology and appropriate patient management.

Keywords: Abnormal uterine bleeding, Endometrial biopsy, Histopathology, Endometrial hyperplasia, Adenocarcinoma, Endometrium.

INTRODUCTION

The endometrium is a dynamic tissue that undergoes cyclic morphological changes under the influence of the hypothalamic pituitary ovarian axis. These changes are regulated primarily by estrogen and progesterone and are essential for implantation and maintenance of early pregnancy. Alterations in hormonal balance or local uterine pathology can lead to a wide spectrum of endometrial abnormalities, which are reflected in the histopathological appearance of the endometrium.[1].

Abnormal uterine bleeding (AUB) is one of the most common gynecological complaints affecting women across all age groups and has a considerable impact on quality of life, physical health, and

healthcare utilization. The incidence is particularly high during the perimenopausal period because of hormonal fluctuations and the increased prevalence of endometrial pathology. Since premalignant and malignant lesions become more frequent with advancing age, prompt evaluation is essential to exclude serious underlying disease.[2-3].

AUB is characterized by abnormalities in the frequency, regularity, duration, or volume of menstrual bleeding. Its etiology is multifactorial and varies according to age, hormonal status, and structural or nonstructural abnormalities of the uterus.[4]. Endometrial sampling is a key diagnostic investigation in women presenting with AUB, particularly those with risk factors for endometrial hyperplasia or carcinoma. It provides valuable information for identifying benign, premalignant, and malignant lesions, thereby facilitating appropriate clinical management and reducing unnecessary surgical interventions.[5].

Histopathological examination of endometrial biopsy specimens remains the gold standard for the diagnosis of endometrial disorders. Although endometrial biopsy and dilatation and curettage may occasionally fail to sample focal lesions, they continue to play a pivotal role in the evaluation of AUB, especially in perimenopausal and postmenopausal women. Accurate histopathological diagnosis enables early detection of significant pathology and guides timely therapeutic decision making.[6].

The present study was undertaken to evaluate the histopathological spectrum of endometrial lesions in women presenting with abnormal uterine bleeding, determine the age wise distribution of these lesions, and classify endometrial pathology into benign and malignant categories.

MATERIALS AND METHODS

Study Design and Setting: This cross-sectional study was conducted in the Department of Pathology at a tertiary care center from August 2020 to December 2022. All endometrial biopsy specimens received in the department during the study period were reviewed. Clinical details, including age and presenting complaints, were obtained from the requisition forms accompanying each specimen.

Specimen Processing and Histopathological Examination: All specimens underwent a detailed gross examination and were fixed in 10% neutral buffered formalin for 12 to 24 hours. Following fixation, tissues were trimmed appropriately, processed through routine dehydration using graded alcohol, cleared with xylene, impregnated with paraffin wax, and embedded in paraffin blocks. Sections measuring 4 to 5 µm were cut using a rotary microtome, mounted on clean labeled glass slides, dried in a hot air oven, and stained with routine hematoxylin and eosin (H&E). The stained slides were examined under light microscopy for histopathological evaluation.

Study Variables: The histopathological findings were evaluated according to patient age, type of specimen, histopathological diagnosis, and final diagnosis. Endometrial lesions were categorized as benign or malignant based on microscopic findings. The age wise distribution and spectrum of endometrial lesions in women presenting with abnormal uterine bleeding were also analyzed.

Statistical Analysis: The collected data were entered into Microsoft Excel and analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized as frequencies and percentages, while continuous variables were expressed as mean ± standard deviation (SD). Appropriate statistical tests were applied wherever required, and a p value of <0.05 was considered statistically significant.

RESULTS

A total of 163 endometrial biopsy specimens from women presenting with abnormal uterine bleeding (AUB) were included in the study. The mean age of the study population was 41.82 ± 9.59 years. The highest proportion of patients belonged to the 40 to 49 years age group (83, 50.92%), followed by the 30 to 39 years age group (39, 23.93%) [Table 1].

Table 1: Age distribution of patients with abnormal uterine bleeding (N = 163).

Age group (years)	Frequency	Percentage
19–29	17	10.43
30–39	39	23.93
40–49	83	50.92
50–59	17	10.43
60–69	4	2.45
70–79	3	1.84
Total	163	100.00

Menorrhagia was the most common presenting complaint, occurring in 67 (41.10%) patients, followed by irregular menses in 20 (12.27%), per vaginal bleeding in 19 (11.66%), polymenorrhea in 13 (7.98%), abdominal pain in 10 (6.13%), dysfunctional uterine bleeding in 9 (5.52%), postmenopausal bleeding in 8 (4.91%), infertility in 6 (3.68%), dysmenorrhea in 5 (3.07%), leucorrhoea in 3 (1.84%), vaginal prolapse in 2 (1.23%), and oligomenorrhea in 1 (0.61%) patient [Table 2].

Radiological evaluation was available for 26 patients. Fibroid was the most frequent radiological

finding, observed in 9 (34.62%) patients, followed by adenomyosis and endometrial polyp in 5 (19.23%) patients each. Associated ovarian cysts were identified in 4 (15.38%) patients, infertility in 2 (7.69%), and hydrosalpinx in 1 (3.85%) patient [Table 3].

Table 2: Clinical presentation of patients with abnormal uterine bleeding according to age group.

Clinical presentation	19–29 years n (%)	30–39 years n (%)	40–49 years n (%)	50–59 years n (%)	60–69 years n (%)	70–79 years n (%)	Total n (%)
Menorrhagia	7 (4.29)	19 (11.66)	35 (21.47)	6 (3.68)	–	–	67 (41.10)
Irregular menses	2 (1.23)	6 (3.68)	9 (5.52)	2 (1.23)	1 (0.61)	–	20 (12.27)
Per vaginal bleeding	3 (1.84)	1 (0.61)	8 (4.91)	3 (1.84)	2 (1.23)	2 (1.23)	19 (11.66)
Dysfunctional uterine bleeding	–	3 (1.84)	6 (3.68)	–	–	–	9 (5.52)
Postmenopausal bleeding	–	–	2 (1.23)	4 (2.45)	1 (0.61)	1 (0.61)	8 (4.91)
Abdominal pain	–	2 (1.23)	8 (4.91)	–	–	–	10 (6.13)
Dysmenorrhea	1 (0.61)	1 (0.61)	3 (1.84)	–	–	–	5 (3.07)
Infertility	3 (1.84)	2 (1.23)	1 (0.61)	–	–	–	6 (3.68)
Leucorrhoea	–	–	2 (1.23)	1 (0.61)	–	–	3 (1.84)
Vaginal prolapse	–	–	1 (0.61)	1 (0.61)	–	–	2 (1.23)
Oligomenorrhea	–	1 (0.61)	–	–	–	–	1 (0.61)
Polymenorrhea	1 (0.61)	4 (2.45)	8 (4.91)	–	–	–	13 (7.98)
Total	17 (10.43)	39 (23.93)	83 (50.92)	17 (10.43)	4 (2.45)	3 (1.84)	163 (100.00)

Table 3: Radiological findings according to age group (n = 26).

Radiological finding	19–29 years n (%)	30–39 years n (%)	40–49 years n (%)	50–59 years n (%)	60–69 years n (%)	70–79 years n (%)	Total n (%)
Adenomyosis	–	1 (3.85)	4 (15.38)	–	–	–	5 (19.23)
Endometrial polyp	–	3 (11.54)	2 (7.69)	–	–	–	5 (19.23)
Fibroid	–	2 (7.69)	6 (23.08)	1 (3.85)	–	–	9 (34.62)
Infertility	2 (7.69)	–	–	–	–	–	2 (7.69)
Hydrosalpinx	–	–	1 (3.85)	–	–	–	1 (3.85)
Associated ovarian cyst	2 (7.69)	1 (3.85)	1 (3.85)	–	–	–	4 (15.38)
Total	4 (15.38)	7 (26.92)	14 (53.85)	1 (3.85)	0	0	26 (100.00)

Histopathological examination demonstrated proliferative endometrium as the most common finding, accounting for 52 (31.90%) cases, followed by secretory endometrium in 38 (23.31%) and endometrial hyperplasia without atypia in 36 (22.09%). Other findings included disordered proliferative endometrium in 11 (6.75%), endometrial polyp in 10 (6.13%), hormonal imbalance in 6 (3.68%), adenocarcinoma in 5 (3.07%), atypical endometrial hyperplasia in 3 (1.84%), and endometritis in 2 (1.23%) cases [Table 4, Figure 1].

Among the 163 patients, non-organic causes of AUB were identified in 140 (85.88%) cases, whereas organic causes accounted for 23 (14.11%) cases. Of the non-organic cases, 130 occurred in women of reproductive age and 10 in peri or postmenopausal women [Table 5].

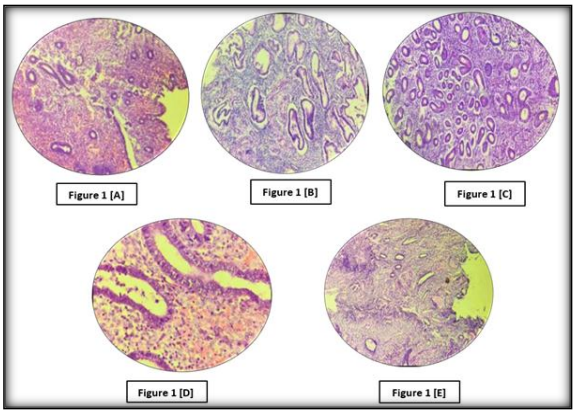

Figure 1: Representative photomicrographs of endometrial lesions. (A) Proliferative endometrium (100×). (B) Secretory endometrium (400×). (C, D) Endometrial hyperplasia without atypia (100× and 400×, respectively). (E) Endometrial polyp (400×).

Table 4: Histopathological findings according to age group (N = 163).

Histopathological diagnosis	19–29 years n (%)	30–39 years n (%)	40–49 years n (%)	50–59 years n (%)	60–69 years n (%)	70–79 years n (%)	Total n (%)
Proliferative phase	9 (5.52)	16 (9.82)	23 (14.11)	3 (1.84)	–	1 (0.61)	52 (31.90)
Secretory phase	4 (2.45)	16 (9.82)	18 (11.04)	–	–	–	38 (23.31)
Disordered proliferative endometrium	1 (0.61)	1 (0.61)	7 (4.29)	2 (1.23)	–	–	11 (6.75)
Endometrial hyperplasia without atypia	1 (0.61)	5 (3.07)	23 (14.11)	4 (2.45)	2 (1.23)	1 (0.61)	36 (22.09)
Adenocarcinoma	1 (0.61)	–	–	3 (1.84)	1 (0.61)	–	5 (3.07)
Endometrial polyp	1 (0.61)	–	6 (3.68)	2 (1.23)	–	1 (0.61)	10 (6.13)
Endometritis	–	–	–	2 (1.23)	–	–	2 (1.23)
Hormonal imbalance	–	1 (0.61)	4 (2.45)	1 (0.61)	–	–	6 (3.68)

Atypical endometrial hyperplasia	–	–	2 (1.23)	–	1 (0.61)	–	3 (1.84)
Total	17 (10.43)	39 (23.93)	83 (50.92)	17 (10.43)	4 (2.45)	3 (1.84)	163 (100.00)

Table 5: Distribution of organic and non-organic causes of abnormal uterine bleeding according to age group.

Type of AUB	Reproductive age, n	Perimenopausal and postmenopausal, n	Total, n (%)
Non-organic causes	130	10	140 (85.88)
Organic causes	9	14	23 (14.11)
Total	139	24	163 (100.00)

Most patients belonged to the reproductive age group (139, 85.28%), followed by the perimenopausal (15, 9.20%) and postmenopausal (9, 5.52%) groups [Table 6].

Table 6: Distribution of abnormal uterine bleeding according to age group (N = 163).

Age group	Frequency	Percentage
Reproductive	139	85.28
Perimenopausal	15	9.20
Postmenopausal	9	5.52
Total	163	100.00

Among the 128 reproductive age women with non-organic AUB, proliferative endometrium was the predominant histopathological pattern (50, 38.75%), followed by secretory endometrium (38, 29.68%), endometrial hyperplasia without atypia (28, 21.87%), disordered proliferative endometrium (9, 7.03%), and atypical endometrial hyperplasia (3, 2.34%)
[Table 7].

Table 7: Histopathological findings in reproductive age women with non-organic abnormal uterine bleeding (n = 128).

Histopathological pattern	Frequency	Percentage
Proliferative phase	50	38.75
Secretory phase	38	29.68
Endometrial hyperplasia without atypia	28	21.87
Disordered proliferative endometrium	9	7.03
Atypical endometrial hyperplasia	3	2.34
Total	128	100.00

Among the 11 reproductive age women with organic causes of AUB, endometrial polyp was the most common lesion, accounting for 6 (54.55%) cases, followed by hormonal effect in 5 (45.45%) cases [Table 8].

Table 8: Organic causes of abnormal uterine bleeding in reproductive age women (n = 11).

Histopathological diagnosis	Frequency	Percentage
Endometrial polyp	6	54.55
Hormonal effect	5	45.45
Endometritis	0	0.00
Total	11	100.00

In the perimenopausal group, endometrial hyperplasia was the most frequent histopathological finding, observed in 4 (26.67%) patients. Proliferative endometrium was identified in 3 (20.00%) patients, while disordered endometrium, endometrial polyp, and adenocarcinoma were each seen in 2 (13.33%) patients. Endometritis and hormonal imbalance were each observed in 1 (6.67%) patient [Table 9; Figure 2].

Among postmenopausal women, endometrial hyperplasia was the predominant finding, present in 4 (44.44%) patients, followed by endometrial polyp and adenocarcinoma in 2 (22.22%) patients each, while endometritis was observed in 1 (11.11%) patient [Table 10; Figure 3].

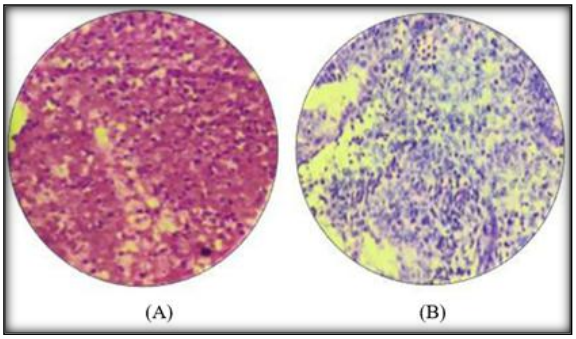

Figure 2: Representative photomicrographs showing (A) endometritis with moderate neutrophilic inflammatory infiltrate in a necrotic and hemorrhagic background (400×) and (B) hormonal effect showing pseudo decidualized stroma (400×).

Table 9: Histopathological findings in perimenopausal women with abnormal uterine bleeding (n = 15).

Histopathological diagnosis	Frequency	Percentage
Endometrial hyperplasia	4	26.67
Proliferative phase	3	20.00
Disordered proliferative endometrium	2	13.33
Endometrial polyp	2	13.33
Adenocarcinoma	2	13.33
Endometritis	1	6.67
Hormonal imbalance	1	6.67
Total	15	100.00

Table 10: Histopathological findings in postmenopausal women with abnormal uterine bleeding (n = 9).

Histopathological diagnosis	Frequency	Percentage
Endometrial hyperplasia	4	44.44
Endometrial polyp	2	22.22
Adenocarcinoma	2	22.22
Disordered proliferative endometrium	0	0.00
Endometritis	1	11.11
Total	9	100.00

Table 11: Distribution of benign and malignant endometrial lesions (N = 163).

Histopathological diagnosis	Frequency	Percentage
Benign lesions	155	95.09
Malignant lesions	8	4.91
Total	163	100.00

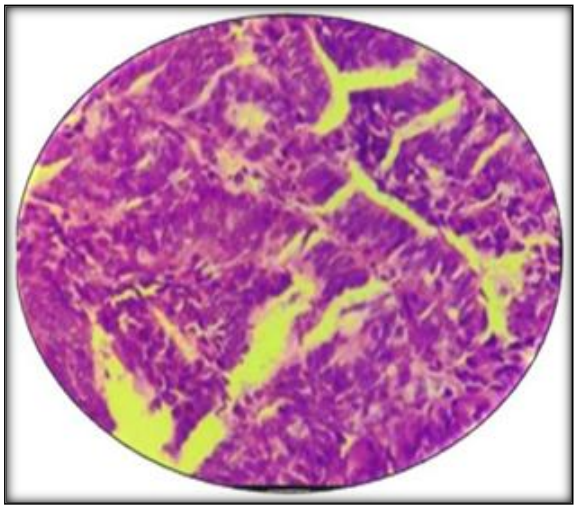

Figure 3: Representative photomicrograph of endometrial adenocarcinoma showing back-to-back irregular glands lined by atypical columnar cells with stromal infiltration (100×).

Overall, 155 (95.09%) endometrial lesions were benign, whereas 8 (4.91%) were classified as premalignant or malignant, comprising adenocarcinoma and atypical endometrial hyperplasia [Table 11].

DISCUSSION

In the present study, the highest proportion of women with AUB belonged to the 40 to 49 years age group (50.92%), with a mean age of 41.82 ± 9.59 years. Similar findings have been reported by Varghese J et al. and Sharma K et al., who observed the highest incidence among women aged 41 to 50 years.[7,8]. In contrast, Sharma N et al. and Hoxhaj O et al. reported the peak incidence in the 31 to 40 years age group, whereas Bharath T et al. found the highest frequency of histomorphological changes in women aged 46 to 55 years.[3,9,10].

Menorrhagia was the most common presenting complaint (41.10%), consistent with previous studies by Sharma K et al., Hoxhaj O et al., Varghese J et al., and Varun N et al., where it was also the predominant clinical presentation.[7,8,10,11]. The frequency of polymenorrhea in our study was comparable to that reported by Varun N et al. and Singh A et al.[11-13].

Among the patients who underwent radiological evaluation, fibroid was the most common finding (34.62%), followed by adenomyosis and endometrial polyp (19.23% each). Similar observations have been reported by Indrani M et al., Bolde SA et al., Chakraborty N et al., Choudhary A et al., and Panchal SK et al.[14-18].

Proliferative endometrium was the predominant histopathological pattern (31.90%), followed by secretory endometrium (23.31%) and endometrial hyperplasia without atypia (22.09%). Comparable findings have been reported by Vani BS et al., Singh A et al., Ahmed M et al., and Malathi BG et al,[4,12,19-20,21]. In contrast, Abdullah LS et al. reported secretory endometrium as the most common histological pattern, while several authors have identified disordered proliferative endometrium as the predominant lesion.[22-26].

Endometrial polyps were identified in 6.13% of cases, which is within the range reported in previous studies.[22,25,27]. Endometrial hyperplasia without atypia accounted for 22.09% of cases, consistent with the findings of Choudhary A et al. and Ahmed M et al,[17,20] Adenocarcinoma was diagnosed in 3.07% of patients, predominantly in women aged 50 to 59 years, similar to reports by Vani BS et al., Balar R et al., Hoxhaj O et al., and Abdullah LS et

al., which demonstrated a higher incidence of malignancy in women older than 50 years.[4,6,10,22].

Most AUB cases in the present study were classified as non-organic (85.88%), comparable to the findings of Varun N et al,[11]. The majority of patients were of reproductive age (85.28%), similar to Gupta I et al,[23]. Within this group, proliferative endometrium was the most frequent histopathological pattern, followed by secretory endometrium and endometrial hyperplasia without atypia, which is in agreement with the observations of Varun N et al,[11]. In the perimenopausal group, endometrial hyperplasia was the most common lesion, whereas endometrial hyperplasia also predominated in postmenopausal women, followed by endometrial polyp and adenocarcinoma. Varun N et al. similarly reported hyperplasia as the predominant lesion among postmenopausal women, with a smaller proportion of malignant cases.[11].

Overall, benign lesions constituted 95.09% of all endometrial biopsies, highlighting that although most endometrial abnormalities associated with AUB are benign, histopathological examination remains essential for the timely detection of premalignant and malignant lesions.

CONCLUSION

Abnormal uterine bleeding is a common gynecological complaint that affects women across all age groups, particularly during the perimenopausal period. In the present study, most endometrial lesions were benign, with proliferative endometrium being the predominant histopathological pattern, followed by secretory endometrium and endometrial hyperplasia without atypia. Premalignant and malignant lesions were identified in a small but clinically significant proportion of patients, emphasizing the importance of timely evaluation. Histopathological examination of endometrial biopsy remains a reliable diagnostic tool for identifying the spectrum of endometrial lesions, distinguishing benign from malignant pathology, and guiding appropriate clinical management. Early endometrial assessment in women presenting with abnormal uterine bleeding can facilitate prompt diagnosis and appropriate treatment, thereby improving patient outcomes.

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