

HISTOPATHOLOGICAL PATTERN OF ENDOMETRIAL BIOPSIES IN PATIENTS WITH ABNORMAL UTERINE BLEEDING

Isra Ali Nawaz^{*1}, Sumaira Khan², Aysha Tanvir³, Asiya Allahdad⁴, Maida Zulfiqar⁵, Mahnoor Mubeen⁶

^{*1,2,3,4,5,6}CMH Rawalpindi, Pakistan

¹israalinawaz056@gmail.com

DOI: <https://doi.org/10.5281/zenodo.19689020>

Keywords

Abnormal uterine bleeding, Endometrial biopsy, Histopathology, Hyperplasia, Endometrial carcinoma

Article History

Received: 13 February 2025

Accepted: 23 March 2025

Published: 08 April 2025

Copyright @Author

Corresponding Author: *

Isra Ali Nawaz

Abstract

Objectives:

To evaluate the histopathological patterns of endometrial biopsies in patients presenting with abnormal uterine bleeding (AUB) and to determine their distribution across different age groups.

Methodology:

This descriptive cross-sectional study was conducted at a tertiary care hospital of Rawalpindi and included 150 patients with AUB selected through non-probability consecutive sampling. Women of reproductive, perimenopausal, and postmenopausal age groups were included, while those with bleeding disorders, hormonal therapy, or known malignancy were excluded. Clinical data were collected using a structured proforma. Endometrial samples were obtained via dilatation and curettage or pipelle biopsy, processed, and examined histopathologically. Qualitative variables included histopathological patterns, while quantitative variables included age, parity, and duration of symptoms. Data were analyzed using statistical software.

Results:

The mean age was 42.6 ± 10.8 years, with most patients in the perimenopausal group. Multiparity was common, and the mean duration of symptoms was 7.4 ± 3.2 months. Menorrhagia was the most frequent complaint. Proliferative endometrium (30%) was the most common histopathological finding, followed by secretory endometrium (20%) and endometrial hyperplasia. Disordered proliferative endometrium and endometritis were also observed, while atrophic endometrium and carcinoma were mainly seen in older women. Functional patterns predominated in younger patients, whereas hyperplasia and malignancy were more frequent in perimenopausal and postmenopausal groups.

Conclusion:

Endometrial biopsy is an essential diagnostic tool in AUB, enabling early detection of premalignant and malignant lesions. Age and symptom duration are important predictors of pathology.

INTRODUCTION

Abnormal uterine bleeding (AUB) is a symptom that deviates from the normal menstrual cycle. AUB involves changes in frequency, volume, and

duration of the menstrual flow¹. In postmenopausal women, it is defined as any bleeding after 1 year of menstrual cessation². The prevalence of this symptom is difficult to

determine, as women may not seek treatment and physicians may depend on the patient's subjective perception of symptoms which fails to meet objective criteria. Around 10%-30% of reproductive age women experience heavy menstrual bleeding, making the estimated prevalence of AUB, a broader term, exceed 10%-30%. The true impact of AUB is seen in subscales that measure the physical and emotional role functioning, hence impeding work productivity and other daily activities³. Abnormal uterine bleeding (AUB) is one of the commonest gynaecological complaints seen in about 10%-15% of women. The female genital tract is highly responsive to sex hormones as compared to any other organ system in the body. Cyclical uterine bleeding marks an important stage of reproductive maturation. AUB includes both organic and nonorganic causes of uterine bleeding⁴. In addition; it is also the commonest cause of iron deficiency anaemia and chronic malaise around the world. It is a disorder which is both medically and socially debilitating. Our present study is based on histopathological correlation of endometrial biopsies in patients in different age groups suffering from AUB. This study was done to evaluate the endometrial causes of AUB and to determine various histopathological patterns associated with AUB in women of different age groups⁵. AUB is a common disorder that one in five women has this problem during their life span. The prevalence of AUB in developing countries including Pakistan is about 5-15%⁶. There is a histological variation of endometrium according to the age of the women, phase of her menstrual cycle and use of any exogenous hormones⁷. Abnormal uterine bleeding (AUB) is the most common health issue seen in women of all age groups. AUB is defined as any bleeding pattern that differs in frequency, duration, and amount from a pattern observed during normal menstrual cycles or menopause. Bleeding is said to be abnormal when the pattern is irregular, of abnormal duration (seven days), or of abnormal amount (>80 ml/menses). AUB is the major gynecological problem responsible for as many as one-third of all outpatient gynecological visits. It

has varied presentations like heavy menstrual bleeding (HMB), frequent cycles, irregular cycles, post-coital bleeding, or post-menopausal bleeding (PMB). It affects women of every age group from adolescence to menopause. It reflects the underlying pathology as simple as hormonal imbalance or carcinoma requiring aggressive treatment. AUB has a significant effect on the quality of life of women⁸. AUB is due to several factors deranging homeostasis like hormonal imbalances, infections, structural lesions, and malignancy. Based on these possible underlying etiologies, the International Federation of Gynaecology and Obstetrics (FIGO) in 2011 devised a classification named PALM-COEIN for the etiology of AUB. PALM accounts for structural features like polyps, adenomyosis, leiomyoma, and malignancy. COEIN addresses non-structural causes like coagulation defects, ovulatory dysfunction, endometrial causes, iatrogenic causes, and non-classified ones⁹. Endometrial biopsy is used as a diagnostic aid in AUB. It is done as a first-line test in women >45 years of age presenting with AUB. Endometrial biopsy is also done in patients <45 years of age with a history of unopposed estrogen exposure, failed medical management, and persistent AUB¹⁰.

METHODOLOGY

The study was designed as a descriptive cross-sectional analysis was carried out over a 6 months period in a tertiary care hospital, where patients attending the gynecology outpatient department with complaints of abnormal uterine bleeding were recruited. A non-probability consecutive sampling technique was employed to include all eligible patients who met the inclusion criteria. Women of reproductive, perimenopausal, and postmenopausal age groups who presented with symptoms such as menorrhagia, metrorrhagia, polymenorrhea, or postmenopausal bleeding were included in the study. Patients with known bleeding disorders, that on hormonal therapy, or with previously diagnosed malignancies were excluded to minimize confounding factors. Data collection was performed systematically using a structured proforma. Detailed clinical

histories, including age, parity, menstrual history, duration and pattern of bleeding, and associated symptoms, were recorded. Endometrial biopsy samples were obtained using standard procedures such as dilatation and curettage or pipelle biopsy. The collected specimens were fixed in formalin, processed, and stained with hematoxylin and eosin for histopathological examination. The slides were then examined under a microscope by experienced histopathologists to identify and classify the endometrial patterns. Qualitative variables in the study included the histopathological patterns of the endometrium, which were categorized into groups such as proliferative endometrium, secretory endometrium, disordered proliferative endometrium, endometrial hyperplasia (with or without atypia), endometritis, atrophic endometrium, and endometrial carcinoma. These variables were descriptive in nature and were analyzed based on their frequency and distribution among different age groups and clinical presentations. The morphological characteristics of each pattern were carefully evaluated, and their clinical significance in relation to abnormal uterine bleeding was interpreted.

Quantitative variables included patient age, duration of symptoms, parity, and frequency of bleeding episodes. These variables were measured numerically and were summarized using statistical measures such as mean, standard deviation, and range. The relationship between quantitative variables and different histopathological findings was assessed to identify trends, such as the prevalence of hyperplasia or malignancy in older age groups or prolonged duration of symptoms. Data analysis was conducted using statistical software. Frequencies and percentages were calculated for qualitative variables, while means and standard deviations were computed for quantitative variables. Stratification was performed to control for potential effect modifiers such as age and parity. Post-stratification analysis was carried out using appropriate statistical tests to determine the significance of associations between clinical features and histopathological findings. Ethical

considerations were strictly followed throughout the study. Informed consent was obtained from all participants prior to inclusion, and confidentiality of patient information was maintained. The study protocol was reviewed and approved by the institutional ethical review committee. Overall, the methodology provided a comprehensive framework to evaluate the spectrum of histopathological patterns in endometrial biopsies and their association with abnormal uterine bleeding, incorporating both qualitative and quantitative variables in a systematic and scientifically rigorous manner.

RESULTS

The study included a total of 150 patients presenting with abnormal uterine bleeding (AUB) who fulfilled the inclusion criteria. The mean age of the patients was 42.6 ± 10.8 years, ranging from 21 to 68 years. The majority of patients belonged to the perimenopausal age group (41–50 years), followed by the reproductive age group (21–40 years), while a smaller proportion comprised postmenopausal women. Most patients were multiparous, and the average duration of symptoms was 7.4 ± 3.2 months. Menorrhagia was the most common presenting complaint, followed by metrorrhagia and postmenopausal bleeding.

Histopathological examination of endometrial biopsies revealed a wide spectrum of patterns. The most frequently observed pattern was proliferative endometrium, followed by secretory endometrium and endometrial hyperplasia. Disordered proliferative endometrium and endometritis were also noted in a significant number of cases. Atrophic endometrium was predominantly seen in postmenopausal women, while endometrial carcinoma was observed in a smaller yet clinically significant proportion of patients, mainly in the older age group.

An association between age and histopathological findings was evident. Functional endometrial patterns such as proliferative and secretory endometrium were more common in younger women, whereas pathological findings like hyperplasia and carcinoma were more frequently observed in perimenopausal and postmenopausal

patients. Similarly, a longer duration of symptoms was associated with an increased likelihood of detecting hyperplasia or malignancy. Multiparity was commonly associated with benign

endometrial patterns, while nulliparity showed a relatively higher association with hyperplastic and malignant conditions.

Table 1: Distribution of Histopathological Patterns in Endometrial Biopsies (n = 150)

Histopathological Pattern	Frequency (n)	Percentage (%)
Proliferative Endometrium	45	30.0%
Secretory Endometrium	30	20.0%
Disordered Proliferative Endometrium	18	12.0%
Endometrial Hyperplasia (without atypia)	20	13.3%
Endometrial Hyperplasia (with atypia)	7	4.7%
Endometritis	12	8.0%
Atrophic Endometrium	10	6.7%
Endometrial Carcinoma	8	5.3%
Total	150	100%

Table 2: Distribution of Histopathological Patterns According to Age Groups

Age Group (Years)	Proliferative	Secretory	Hyperplasia	Endometritis	Atrophic	Carcinoma	Total
21-40	28	22	5	8	0	0	63
41-50	15	8	15	4	2	2	46
>50	2	0	7	0	8	6	24
Total	45	30	27	12	10	8	150

Overall, the results demonstrated that benign functional endometrial patterns were the most common findings in patients with abnormal uterine bleeding. However, a considerable proportion of patients, particularly in older age groups, exhibited premalignant and malignant lesions. These findings highlight the importance of histopathological evaluation in all cases of abnormal uterine bleeding for early diagnosis and appropriate management.

DISCUSSION

The results of my research showed that a total of 150 patients presenting with abnormal uterine bleeding (AUB) were included, all of whom fulfilled the inclusion criteria. The mean age of the patients was 42.6 ± 10.8 years, with an age range of 21 to 68 years. Most of the patients

belonged to the perimenopausal age group (41-50 years), followed by those in the reproductive age group (21-40 years), while a smaller proportion consisted of postmenopausal women. In comparison, another study conducted in 2022 reported that normal cyclic endometrial changes accounted for the highest proportion of histopathological findings. However, hyperplasia and malignancies were identified as significant causes of bleeding in perimenopausal and postmenopausal women. The study also highlighted that although the use of dilatation and curettage (D&C) as a sampling tool in AUB cases remains debatable, it is highly effective in diagnosing premalignant and malignant conditions ⁽¹¹⁾. In my study, the majority of patients were multiparous, and the mean duration of symptoms was 7.4 ± 3.2 months.

Menorrhagia was the most common presenting complaint, followed by metrorrhagia and postmenopausal bleeding. Similarly, a study conducted in 2023 emphasized that histopathological examination of endometrial biopsy specimens in patients with AUB is considered the gold standard for evaluation, diagnosis, and management, and it helps in preventing future complications⁽¹²⁾.

Furthermore, the histopathological examination of endometrial biopsies in my study revealed a broad spectrum of patterns. The most commonly observed pattern was proliferative endometrium, followed by secretory endometrium and endometrial hyperplasia. These findings are consistent with another study conducted in 2023, which reported that histopathological evaluation of the endometrium provides clear differentiation between physiological and malignant changes. Therefore, endometrial sampling is regarded as a highly reliable and essential tool for accurate assessment of endometrial pathology⁽¹³⁾. In addition, disordered proliferative endometrium and endometritis were observed in a considerable number of cases in my study. Atrophic endometrium was predominantly seen in postmenopausal women, whereas endometrial carcinoma was detected in a smaller yet clinically important proportion of patients, mainly among the older age group. Supporting these findings, a 2023 study concluded that abnormal uterine bleeding presents with varied histomorphological patterns across different age groups, with non-structural causes being more common than structural ones. The study also noted that all age groups are susceptible to endometrial polyps, which were the most frequent finding, while all malignant cases were confined to postmenopausal women. Hence, it emphasized the importance of evaluating endometrial biopsies, particularly in postmenopausal patients⁽¹⁴⁾.

Moreover, my study demonstrated a clear association between age and histopathological findings. Functional endometrial patterns, such as proliferative and secretory endometrium, were more commonly seen in younger women. In contrast, pathological conditions like endometrial hyperplasia and carcinoma were more frequently

observed in perimenopausal and postmenopausal women. A study conducted in 2020 reported similar findings, where proliferative endometrium was the most common pattern in patients without organic pathology, while endometrial hyperplasia was the most frequent organic lesion. The study further recommended endometrial sampling, particularly in women aged 40 years and above, to exclude premalignant and malignant conditions⁽¹⁵⁾. Additionally, my findings indicated that a longer duration of symptoms was associated with an increased likelihood of detecting hyperplasia or malignancy. Multiparity was generally associated with benign endometrial patterns, whereas nulliparity showed a relatively higher association with hyperplastic and malignant lesions. In agreement with these observations, a 2024 study reported that the majority of AUB cases were clustered in the reproductive age group, with proliferative and secretory endometrium being the most common underlying causes of abnormal uterine bleeding⁽¹⁶⁾.

CONCLUSION

Abnormal uterine bleeding (AUB) is a common gynecological condition with a wide spectrum of underlying causes that vary across different age groups. Histopathological evaluation of endometrial biopsies plays a crucial role in identifying both benign and pathological patterns, aiding in accurate diagnosis and management. The present study demonstrated that functional endometrial changes were most common in younger women, whereas hyperplasia and malignancy were more frequent in perimenopausal and postmenopausal patients. These findings emphasize the importance of timely endometrial assessment, particularly in older women and those with prolonged symptoms. Early diagnosis through endometrial sampling can help prevent complications and improve patient outcomes.

REFERENCE

- Fraser IS, Critchley HO, Munro MG, Broder M. Can we achieve international agreement on terminologies and definitions used to describe abnormalities of menstrual bleeding? *Human reproduction*. 2007 Mar 1; 22(3):635-43.
- Munro MG, Southern California Permanente Medical Group's Abnormal Uterine Bleeding Working G. Investigation of women with postmenopausal uterine bleeding: clinical practice recommendations. *Perm J*. 2014; 18(1):55-70.
- Liu Z, Doan QV, Blumenthal P, Dubois RW. A systematic review evaluating health-related quality of life, work impairment, and health-care costs and utilization in abnormal uterine bleeding. *Value in health*. 2007 May;10(3):183-94.
- Jairajpuri ZS, Rana S, Jetley S. Atypical uterine bleeding-Histopathological audit of endometrium A study of 638 cases. *Al Ameen J Med Sci*. 2013 Apr 24;6(1):21-8.
- Al-Neaimy WM, Ahmed MT, Al-Jawadi SI. Histopathological Interpretation of Abnormal uterine bleeding after the age of 40 year. *Iraqi Postgrad Med J*. 2010;9(3):274-82.
- Harlow SD, Campbell OM. Epidemiology of menstrual disorders in developing countries: a systematic review. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2004 Jan 1;111(1).
- Mazur MT, Kurman RJ. Normal endometrium and infertility evaluation. In *Diagnosis of endometrial biopsies and curettings: A practical approach 2005* (pp. 7-33). New York, NY: Springer New York.
- Maybin JA, Critchley HO. Menstrual physiology: implications for endometrial pathology and beyond. *Human reproduction update*. 2015 Nov 1;21(6):748-61.
- Mishra D, Sultan S. FIGO'S PALM-COEIN Classification of abnormal uterine bleeding: A Clinico-Histopathological correlation in Indian setting. *The Journal of Obstetrics and Gynecology of India*. 2017 Apr;67(2):119-25.
- Women NR. CommiTTee opinion.
- Alshdaifat EH, El-Deen Al-Horani SS, Al-Sous MM, Al-Horani S, Sahawneh FE, Sindiani AM. Histopathological pattern of endometrial biopsies in patients with abnormal uterine bleeding in a tertiary referral hospital in Jordan. *Annals of Saudi Medicine*. 2022 May; 42(3):204-13.
- Ranjan S, Kumar H, Gore C, Chandanwale S, Bhide A, Desai A. Histopathological Pattern of Endometrial Biopsies in Patients with Abnormal Uterine Bleeding. *Medical Journal of Dr. DY Patil Vidyapeeth*. 2023 Jul 1;16(4):599-604.
- Kaur S, Gulia SP, Khatri D, Malik V. Histopathological pattern of endometrial biopsy in abnormal uterine bleeding.
- Jalbani A, Rahat N, Shazad H, Bashir P, Siraj F. Clinico-Pathological Study of Endometrial Biopsies Performed for Abnormal Uterine Bleeding: An Audit in a Tertiary Care Centre in Karachi, Sindh, Pakistan. *In Medical Forum Monthly* 2023 Jul 30 (Vol. 34, No. 7).
- Manzoor UZ, Jahan MU, Aslam IR, Saleem SA, Parveen NU, Zain MO. The Histopathological Patterns of Endometrium on Endometrial sampling in patients with abnormal uterine bleeding. *Pakistan Journal of Medical and Health Sciences*. 2020;14(4):795.
- Bhandari R, Kandel J. Histopathological Pattern of Endometrial Biopsies in Patients with Abnormal Uterine Bleeding in a Tertiary Referral Hospital. *Journal of Nobel Medical College*. 2024 Dec 31;13(2):36-40.