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ORIGINAL RESEARCH

HISTOPATHOLOGICAL SPECTRUM OF ENDOMETRIAL FINDINGS IN WOMEN WITH ABNORMAL UTERINE BLEEDING: A RETROSPECTIVE STUDY AT A TERTIARY CARE TEACHING HOSPITAL IN NORTH-WESTERN INDIA

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ABSTRACT

Background: Abnormal uterine bleeding (AUB) is a common gynaecological presentation with causes ranging from physiological hormonal variation to premalignant and malignant endometrial disease. Histopathological examination of endometrial tissue remains central to identifying clinically important endometrial lesions. **Methods:** This retrospective, descriptive, single-centre study included 101 women evaluated for AUB in the Department of Pathology, Adesh Institute of Medical Sciences and Research, Bathinda, Punjab (, between 1 January 2025 and 31 December 2025. The specimens comprised 65 hysterectomy specimens and 36 endometrial curettings or biopsies. Clinical details were retrieved from medical records. Tissues were fixed in 10% neutral buffered formalin, processed routinely, sectioned at 4–5 µm, stained with haematoxylin and eosin, and examined by light microscopy. Diagnoses were assigned according to the World Health Organization classification of tumours of the female genital tract. Findings were summarised as frequencies and percentages; no inferential statistical testing was performed. **Results:** The largest age group was 41–50 years (43/101, 42.6%). Heavy menstrual bleeding, recorded in the source records as menorrhagia, was the most frequent presentation (69/101, 68.3%). Proliferative endometrium was the most common histological finding (36/101, 35.6%), followed by secretory endometrium (23/101, 22.8%) and disordered proliferative endometrium (15/101, 14.9%). Atrophic endometrium was seen in nine cases (8.9%). Cyclical or non-neoplastic patterns accounted for 83 cases (82.2%) and organic endometrial lesions for 18 cases (17.8%). Endometrial polyps and endometrial hyperplasia were each identified in six cases (5.9%), endometritis in three (3.0%), and endometrial carcinoma in three (3.0%). **Conclusion:** Most endometrial specimens from women with AUB showed benign cyclical or non-neoplastic patterns. Nevertheless, the detection of hyperplasia and carcinoma in 8.9% of the cohort supports systematic endometrial assessment, particularly in women aged 40 years or older and in those with persistent, recurrent, or postmenopausal bleeding.

Keywords: Abnormal uterine bleeding; Endometrium; Endometrial biopsy; Histopathology; Endometrial hyperplasia; Endometrial carcinoma.

INTRODUCTION

Abnormal uterine bleeding (AUB) is an umbrella term for uterine bleeding that is abnormal in frequency, regularity, duration, or volume. The International Federation of Gynecology and Obstetrics (FIGO) developed standardised terminology for bleeding symptoms and the PALM-COEIN system for classifying causes of AUB in women of reproductive age [1]. The PALM group comprises structural causes polyp, adenomyosis, leiomyoma, and malignancy or hyperplasia whereas COEIN comprises coagulopathy, ovulatory dysfunction, endometrial causes, iatrogenic causes, and causes not otherwise classified.

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The endometrium undergoes predictable morphological changes in response to ovarian hormones. Interpretation of endometrial samples therefore requires correlation with age, menstrual history, hormonal exposure, imaging, and the timing of sampling. Histological patterns in women with AUB range from normal proliferative or secretory endometrium to disordered proliferation, atrophy, inflammation, polyps, hyperplasia, and carcinoma [2–4].

Endometrial sampling is particularly important when bleeding is persistent or recurrent, when risk factors for endometrial neoplasia are present, or when bleeding occurs after menopause. Although most samples demonstrate benign changes, histopathological assessment identifies premalignant and malignant lesions that require prompt management [2,3].

Published studies from India and other settings report considerable variation in the distribution of endometrial findings, reflecting differences in age structure, referral patterns, sampling methods, and case definitions [2–6]. Comparatively few series from the Malwa region of south-western Punjab have been reported. The present study was undertaken to describe the clinical presentation and histopathological spectrum of endometrial findings among women investigated for AUB at a tertiary care teaching hospital in this region.

MATERIALS AND METHODS

Study design and setting

This retrospective, descriptive, single-centre study was conducted in the Department of Pathology, Adesh Institute of Medical Sciences and Research, Bathinda, Punjab, India, a tertiary care teaching hospital serving the Malwa region of south-western Punjab in north-western India. The study period was 1 January 2025 to 31 December 2025 (12 months). All consecutive eligible endometrial specimens received during this period were included.

Ethical considerations

The study was approved by the Institutional Ethics Committee of Adesh Institute of Medical Sciences and Research, Bathinda. Clinical and histopathological data were retrieved from institutional archives and analysed without direct patient contact; and all data were de-identified before analysis.

Study population

Women of any age presenting with AUB for whom an endometrial specimen was submitted for histopathological examination were eligible. A total of 101 specimens were analysed: 65 hysterectomy specimens and 36 endometrial samples obtained by curettage or biopsy. Cases with isolated cervical or vaginal pathology, known haemostatic disorders, inadequate or poorly processed specimens, or incomplete clinical records were excluded, as were repeat samples from the same woman. Menopausal status was defined according to World Health Organization criteria, postmenopausal bleeding being bleeding occurring more than 12 months after the last menstrual period [8].

Clinical and histopathological assessment

Age, menstrual status, bleeding pattern, dysmenorrhoea, cycle regularity, and relevant clinical findings were obtained from case records. All specimens were received in 10% neutral buffered formalin and examined grossly. Representative tissue was processed in an automated tissue processor, embedded in paraffin, sectioned at 4–5 µm, and stained with haematoxylin and eosin. Each case was evaluated by light microscopy and assigned a final histopathological diagnosis in accordance with the World Health Organization classification of tumours of the female genital tract [7].

For presentation, histological diagnoses were grouped as cyclical or non-neoplastic endometrial patterns (proliferative, secretory, atrophic, and disordered proliferative endometrium) and organic endometrial lesions (polyp, endometritis, hyperplasia, and carcinoma). This grouping was used to describe the tissue findings and should not be interpreted as a complete PALM–COEIN classification [1], because several COEIN categories require clinical, laboratory, and imaging information rather than histology alone [1,11].

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Bleeding patterns were recorded in the source case files using traditional descriptive terms. For clarity, these have been mapped to current FIGO symptom terminology in Table 2; the original record terms are retained alongside so that the data are not misrepresented [1].

Statistical analysis

Data were entered into a spreadsheet and summarised using frequencies and percentages. Percentages were recalculated from the reported case counts, using 101 as the denominator for the overall cohort and the relevant subgroup denominator for grouped findings. Percentages are reported to one decimal place. Given the descriptive aim and the modest sample size, no inferential statistical testing was undertaken and no measures of association are reported.

RESULTS

The study included 101 women with AUB. The age distribution is shown in Table 1. Women aged 41–50 years constituted the largest group (43/101, 42.6%), followed by those aged 31–40 years (27/101, 26.7%). Twenty-five women (24.8%) were aged 51 years or older.

Table 1. Age distribution of women with abnormal uterine bleeding (n = 101)

Age group (years)	Number	Percentage
≤30	6	5.9
31–40	27	26.7
41–50	43	42.6
51–60	14	13.9
≥61	11	10.9

Note: Percentages are calculated on a denominator of 101 and may not sum to exactly 100.0 owing to rounding.

The clinical bleeding patterns recorded in the case files are presented in Table 2, together with the corresponding current FIGO symptom terminology. Heavy menstrual bleeding (recorded as menorrhagia) was the most frequent presentation (69/101, 68.3%), followed by intermenstrual or irregular bleeding (recorded as metrorrhagia) in 22 women (21.8%). Postmenopausal bleeding was recorded as the presenting complaint in two women (2.0%).

Table 2. Recorded clinical bleeding patterns and corresponding FIGO terminology (n = 101)

Term used in case records	Corresponding FIGO term [1]	Number (%)
Menorrhagia	Heavy menstrual bleeding	69 (68.3)
Metrorrhagia	Intermenstrual / irregular bleeding	22 (21.8)
Polymenorrhoea	Frequent menstrual bleeding	6 (5.9)
Oligomenorrhoea	Infrequent menstrual bleeding	2 (2)
Postmenopausal bleeding	Postmenopausal bleeding	2 (2)
Total		101

Each woman was assigned the single predominant bleeding pattern recorded in the case file; categories are therefore mutually exclusive.

The histopathological spectrum is shown in Table 3. Proliferative endometrium was the most frequent finding (36/101, 35.6%), followed by secretory endometrium (23/101, 22.8%) and disordered proliferative endometrium (15/101, 14.9%). Atrophic endometrium was identified in nine cases (8.9%).

Grouped descriptively, cyclical or non-neoplastic endometrial patterns accounted for 83 cases (82.2%) and organic endometrial lesions for 18 cases (17.8%). The organic lesions comprised six endometrial polyps (5.9% of the cohort; 6/18, 33.3% of organic lesions), six endometrial hyperplasias (5.9%; 33.3%), three cases of endometritis (3.0%; 16.7%), and three endometrial carcinomas (3.0%; 16.7%). Premalignant or malignant endometrial pathology (hyperplasia or carcinoma) was thus present in nine women, or 8.9% of the cohort.

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Table 3. Histopathological findings in endometrial specimens (n = 101)

Histopathological finding	Number	% of cohort	% within group
Cyclical / non-neoplastic patterns	83	82.2	100.0
Proliferative endometrium	36	35.6	43.4
Secretory endometrium	23	22.8	27.7
Disordered proliferative endometrium	15	14.9	18.1
Atrophic endometrium	9	8.9	10.8
Organic endometrial lesions	18	17.8	100.0
Endometrial polyp	6	5.9	33.3
Endometrial hyperplasia	6	5.9	33.3
Endometritis	3	3.0	16.7
Endometrial carcinoma	3	3.0	16.7
Total	101	100.0	–

Group denominators are 83 for cyclical/non-neoplastic patterns and 18 for organic lesions.

Group denominators are 83 for cyclical/non-neoplastic patterns and 18 for organic lesions.

DISCUSSION

In this retrospective series, AUB was most frequently investigated in women aged 41–50 years, and the predominant recorded symptom was heavy menstrual bleeding. The age distribution is consistent with the increased frequency of anovulatory cycles and endometrial instability during the menopausal transition. Similar hospital-based studies have reported that perimenopausal women form a substantial proportion of patients undergoing endometrial sampling for AUB [2–4].

Proliferative endometrium was the most common histological pattern, followed by secretory and disordered proliferative endometrium. Doraiswami et al. likewise found proliferative endometrium to be a common pattern among women investigated for AUB [2]. Differences between series are expected, because endometrial morphology varies with age, ovulatory status, timing of sampling, hormonal treatment, and the clinical threshold for biopsy.

Disordered proliferative endometrium accounted for 14.9% of cases. This pattern reflects persistent oestrogenic stimulation with irregular glandular architecture that falls short of the criteria for endometrial hyperplasia. Its recognition is clinically relevant because it may indicate ovulatory dysfunction, and it warrants correlation with the patient's age, bleeding history, imaging, and metabolic risk factors.

Endometrial polyps and hyperplasia were the most frequent organic lesions, each occurring in 5.9% of the cohort. Reported frequencies of polyps and hyperplasia vary widely across populations and study designs [2–6]. Focal lesions may be under-represented in blind curettage specimens, whereas series incorporating hysteroscopy or hysterectomy tend to detect more polyps [9]. Because 65 of the 101 specimens in the present series were hysterectomies, the polyp frequency reported here is unlikely to be an underestimate and may not be generalisable to settings where office endometrial sampling predominates.

Endometrial carcinoma was identified in three women (3.0%) and endometrial hyperplasia in a further six (5.9%), so that clinically significant premalignant or malignant pathology was present in approximately one in eleven women sampled. Although malignant lesions were uncommon, their presence reinforces the need for risk-based investigation of AUB, particularly in women aged 40 years or older and in those with persistent symptoms, obesity, diabetes, chronic anovulation, or other risk factors for endometrial neoplasia. Only two women in this series presented with postmenopausal bleeding, so the present data cannot be used to quantify the yield of endometrial sampling in that group. Globally, cancer of the uterine corpus remains a substantial and increasing health burden [10].

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The FIGO PALM–COEIN system provides a useful framework for clinical classification, but histopathology alone cannot assign all AUB categories [1]. Coagulopathy, ovulatory dysfunction, iatrogenic causes, and causes not otherwise classified require clinical, laboratory, and imaging data. Indian series that have applied PALM–COEIN prospectively with clinical correlation illustrate both the utility of the framework and the additional data required to use it fully [11,12]. The present findings should therefore be interpreted as a description of endometrial histology rather than a complete aetiological classification of AUB.

Limitations

It is a retrospective, single-centre series of modest size, and only women who underwent tissue sampling were included, so selection bias is likely. Information on comorbidities, body mass index, medication and hormonal exposure, imaging findings, and subsequent treatment was could not analysed. Hysterectomy specimens and curettings or biopsies were pooled; because lesion detection differs between these specimen types, the pooled estimates may not apply to either group individually. Endometrial hyperplasias were reported as a single category and were not subclassified as hyperplasia without atypia versus atypical hyperplasia / endometrioid intraepithelial neoplasia, and the carcinomas were not further typed or graded; this limits the clinical inference that can be drawn from these categories.

CONCLUSION

Benign cyclical and non-neoplastic endometrial patterns constituted the majority of histopathological findings among women evaluated for AUB at this centre, with proliferative endometrium the most frequent single diagnosis. Endometrial polyps, hyperplasia, and carcinoma were less common but clinically important, together accounting for approximately one in seven specimens. Endometrial evaluation guided by age, bleeding characteristics, imaging, and individual risk factors remains essential for the timely recognition of premalignant and malignant disease. Larger prospective studies with full clinical correlation, WHO subclassification of hyperplasia, and separate analysis of biopsy and hysterectomy specimens are required to refine risk-based sampling strategies in this population.

Declarations

Funding: The authors received no specific funding for this study.

Conflicts of interest: The authors declare that they have no conflicts of interest.

Data availability: The anonymised dataset supporting the findings of this study is available from the corresponding author on reasonable request prior permission form the institute.

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References

1. Munro MG, Critchley HOD, Fraser IS; FIGO Menstrual Disorders Committee. The two FIGO systems for normal and abnormal uterine bleeding symptoms and classification of causes of abnormal uterine bleeding in the reproductive years: 2018 revisions. Int J Gynaecol Obstet. 2018;143(3):393–408. https://doi.org/10.1002/ijgo.12666
2. Doraiswami S, Johnson T, Rao S, Rajkumar A, Vijayaraghavan J, Panicker VK. Study of endometrial pathology in abnormal uterine bleeding. J Obstet Gynaecol India. 2011;61(4):426–430. https://doi.org/10.1007/s13224-011-0047-2
3. Jetley S, Rana S, Jairajpuri ZS. Morphological spectrum of endometrial pathology in middle-aged women with atypical uterine bleeding: a study of 219 cases. J Midlife Health. 2013;4(4):216–220. https://doi.org/10.4103/0976-7800.122242
4. Damle RP, Dravid NV, Suryawanshi KH, Gadre AS, Bagale PS, Ahire N. Clinicopathological spectrum of endometrial changes in perimenopausal and post-menopausal abnormal uterine bleeding: a 2 years study. J Clin Diagn Res. 2013;7(12):2774–2776. https://doi.org/10.7860/JCDR/2013/6291.3755
5. Sun Y, Wang Y, Mao L, Wen J, Bai W. Prevalence of abnormal uterine bleeding according to the new International Federation of Gynecology and Obstetrics classification in Chinese women of reproductive age: a cross-sectional study. Medicine (Baltimore). 2018;97(31):e11457. https://doi.org/10.1097/MD.0000000000011457

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6. Sabre A, Serventi L, Nuritdinova D, Schiattarella A, Sisti G. Abnormal uterine bleeding types according to the PALM-COEIN FIGO classification in a medically underserved American community. J Turk Ger Gynecol Assoc. 2021;22(2):91–96. https://doi.org/10.4274/jtgga.galenos.2021.2020.0228

7. WHO Classification of Tumours Editorial Board. Female Genital Tumours. 5th ed. Lyon: International Agency for Research on Cancer; 2020. (WHO Classification of Tumours Series, vol. 4.)

8. World Health Organization. Research on the Menopause in the 1990s: Report of a WHO Scientific Group. Geneva: World Health Organization; 1996. (WHO Technical Report Series No. 866.)

9. Jose AA, Daniel M, Phansalkar MD. Hysteropathological correlation in abnormal uterine bleeding in a tertiary care hospital in South India. J Obstet Gynaecol India. 2024;74(2):150–157. https://doi.org/10.1007/s13224-023-01888-1

10. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2024;74(3):229–263. https://doi.org/10.3322/caac.21834

11. Mishra D, Sultan S. FIGO's PALM–COEIN classification of abnormal uterine bleeding: a clinico-histopathological correlation in Indian setting. J Obstet Gynaecol India. 2017;67(2):119–125. https://doi.org/10.1007/s13224-016-0925-8

12. Trivedi FJ, Deliwala KJ, Deliwala DJ, Patel SV. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in non-gravid women. Int J Reprod Contracept Obstet Gynecol. 2024;13(5):1140–1143. https://doi.org/10.18203/2320-1770.ijrcog20241124

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