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Histopathological Study of Endometrial Patterns in Patients with Abnormal Uterine Bleeding at a Tertiary Care Hospital

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ABSTRACT

Background: Histopathological assessment of endometrial samples plays a crucial role in diagnosing Abnormal Uterine Bleeding (AUB). This study was undertaken to evaluate the histopathological patterns of the endometrium in patients presenting with AUB. **Methods:** This prospective study was conducted in the Departments of Obstetrics & Gynaecology and Pathology at Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India. All patients attending the Gynaecology OPD with complaints of AUB were included. Endometrial samples obtained via dilatation and curettage (D&C), endometrial biopsy, polypectomy, or hysterectomy were processed routinely, stained with hematoxylin and eosin, and examined microscopically. The findings were recorded and analyzed. **Results:** A total of 320 cases were studied, of which 311 yielded satisfactory samples, while 9 were deemed unsatisfactory for evaluation. The most common histomorphological pattern observed was proliferative endometrium (115 cases, 35.9%), followed by leiomyoma (45 cases, 14.1%), adenomyosis (40 cases, 12.5%), endometrial hyperplasia (33 cases, 10.3%), secretory endometrium (24 cases, 7.5%), atrophic endometrium (18 cases, 5.6%), endometrial polyp (11 cases, 3.4%), endometritis (7 cases, 2.2%), and combined adenomyosis with leiomyoma (9 cases, 2.8%). Endometrial carcinoma was observed in only 2 cases (0.6%). **Conclusions:**
AUB is commonly observed in the perimenopausal age group, particularly during the fourth and fifth decades of life, with menorrhagia being the most frequent clinical presentation. The predominant histopathological finding was proliferative endometrium, suggestive of anovulatory cycles. Endometrial histopathology in AUB patients revealed a broad spectrum of changes ranging from benign to malignant conditions. Accurate histopathological analysis of endometrial samples is essential for appropriate diagnosis and management of AUB.

Keywords: AUB, Endometrium, Leiomyoma, Menorrhagia

INTRODUCTION

Abnormal uterine bleeding (AUB) refers to any deviation in the frequency, duration, or volume of menstrual bleeding. It is a common gynecological complaint affecting women across all age groups and accounts for approximately 20–30% of outpatient visits among women of reproductive age, and up to 69% in peri- and postmenopausal women.[1,2] To standardize the classification of AUB in non-pregnant women of reproductive age, the International Federation of Gynecology and Obstetrics (FIGO) introduced the PALM-COEIN system. This categorization includes both structural and non-structural causes: **P**olyp, Adenomyosis, Leiomyoma, Malignancy and Hyperplasia (PALM) and Coagulopathy, Ovulatory disorders, Endometrial, Iatrogenic, and Not yet classified (COEIN).[3]

The clinical presentations of AUB include menorrhagia, polymenorrhoea, metrorrhagia, and intermenstrual bleeding. FIGO has proposed revised terminology:
a) *Heavy Menstrual Bleeding (HMB)* replaces menorrhagia;
b) *Intermenstrual Bleeding (IMB)* replaces metrorrhagia;
c) *Heavy and Prolonged Bleeding (HPB)* replaces menometrorrhagia;
d) *Frequent Menstrual Bleeding* replaces polymenorrhoea.[4]

Traditionally, **dilatation and curettage (D&C)** has been the standard method for endometrial sampling, now often performed under hysteroscopic guidance to allow for targeted therapeutic interventions.[5] Additionally, transvaginal or transabdominal ultrasound serves as a valuable, non-invasive tool in evaluating endometrial pathology.[6] While medical management is typically the first line of treatment, several minimally invasive surgical options such as endometrial ablation, thermal balloon therapy, and uterine artery embolization have emerged as alternatives to hysterectomy.[7]

Hysterectomy remains one of the most commonly performed gynecological surgeries worldwide and is a definitive treatment for AUB, especially when conservative measures fail.[8] In adolescents, AUB is often functional in origin, whereas in women nearing the end of reproductive life, organic causes become more prevalent. Pregnancy-related conditions are the most common causes in reproductive-age women.[9]

Histopathological examination of endometrial tissue plays a crucial role in identifying the underlying cause of AUB. The spectrum of endometrial changes varies with age and includes an increased risk of endometrial hyperplasia and carcinoma, particularly in peri- and postmenopausal women. Therefore, early evaluation is vital to determine the nature of the lesion and to rule out malignancy.[10] The present study was undertaken to evaluate the histopathological patterns of the endometrium in patients with AUB across different age groups and to identify specific pathologies contributing to abnormal bleeding.

MATERIAL AND METHODOLGY

This prospective study titled *"Clinico-pathological Study of Abnormal Uterine Bleeding"* was conducted in the Departments of Obstetrics & Gynaecology and

Pathology at Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, from **January 2017 to December 2018**. Ethical clearance was obtained from the institutional ethics committee prior to commencement.

Study Design: Prospective observational study.

Sample Collection and Analysis: The study included endometrial tissue specimens obtained via dilatation and curettage (D&C), endometrial biopsy, polypectomy, and hysterectomy. The clinical data of each patient—including age, parity, dominant bleeding pattern, radiological findings, operative observations, and provisional diagnosis—were retrieved from medical records.

Inclusion Criteria

- All clinically diagnosed cases of AUB in non-pregnant women.

Exclusion Criteria

- Pregnancy-related complications (e.g., threatened/incomplete/missed miscarriage, ectopic pregnancy)
- Gestational trophoblastic diseases
- Vaginal or cervical pathologies
- Functional ovarian tumors
- Thyroid disorders
- Hemostatic/coagulopathy disorders

Histopathological Procedure

All specimens were fixed in 10% neutral-buffered formalin. Gross examination was performed to assess the appearance and extent of the lesion.

- For endometrial biopsy and D&C samples, the entire tissue was submitted for processing.
- For hysterectomy specimens, sections were systematically taken from the endometrium, myometrium, cervix, and any associated lesion.
- Tissues were processed using standard protocols, and slides were stained with hematoxylin and eosin (H&E). Special stains were employed as required. All slides were examined microscopically for morphological assessment.

Statistical Analysis

Clinical and histopathological data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS), Version 14.0 for Windows.

OBSERVATION AND RESULTS

In this study spanning from January 2017-December 2018, 320 cases of abnormal uterine bleeding were collected from Gynaecology OPD and ward. The distributions of nature of sample are shown in Table 1. Out of 320 cases, 311 were endometrial lesions

and in 11 cases no diagnosis was given because of an inadequate sample of D and C material, hence excluded from the study.

Table 1 Distribution of nature of sample (n=320)

Nature of sample	**No of Specimen**	**Percentage (%)**
Endometrial biopsy, D and C sample	162	50.6
Hysterectomy	129	40.3
Polypectomy	20	6.3
Inadequate sample	9	2.8
Total	320	100

Among the 320 cases, the majority of cases were in the age group 41-50 years i.e. 126 cases (40.5%), followed by 95 cases (30.5%) belonging to 31-40 years of age (Table 2).

Table 2 Distribution of cases according to age group (n=311)

Age group	**No of Cases**	**Percentage (%)**
21-30	36	11.6
31-40	95	30.5
41-50	126	40.5
51-60	37	11.9
61-70	15	4.8
71-80	2	0.6
total	211	100

In the present study, predominant pattern of AUB were reported as menorrhagia in 157 cases (50.5%), followed by intermenstrual bleeding in 58 cases (18.6%), polymenorrhagia in 36 cases (11.6%), while metrorrhagia was seen in 33 cases (10.6%) (Table 3).

Table 3 Distribution of bleeding pattern according to age group

Age group	**Menorrhagia**	**Metrorrhagia**	**Polymenorrhagia**	**Menorrmetrorrhagia**	**Intermenstrual Bleeding**	**Total**
21-30	16	4	6	3	4	33
31-40	36	13	10	9	16	84
41-50	75	8	14	11	26	134
51-60	15	5	5	3	8	36
61-70	14	3	1	1	3	22
71-80	1	0	0	0	1	2
Total	157 **(50.5%)**	33 **(10.6%)**	36 **(11.6%)**	27 **(8.7%)**	58 **(18.6%)**	311

Spectrum of endometrial findings, found in present study were proliferative endometrium was the most frequent finding 115 (35.9%), leiomyoma comprised of 45 cases (14.1%), adenomyosis 40 cases (12.5%), endometrial hyperplasia 33 cases (10.3%), secretory endometrium 25 cases (6.91%), atrophic endometrium 18 cases (5.6%), endometrial polyp 11 cases (3.4), endometritis 7 cases (2.2%), endometrial carcinoma 2 cases (0.6%) (Table 4).

Table 4 Age wise distribution of endometr ial lesions

Age group	21-30	31-40	41-50	51-60	61-70	71-80	total
Proliferative endometrium	20	37	46	17	4	0	115**(35.9%)**
Secretory endometrium	5	7	12	1	0	0	25 **(7.8%)**
Atrophic endometrium	0	3	2	6	5	2	18 **(5.6%)**
Endometritis	2	2	3	0	0	0	7 **(2.2%)**
Endometrial hyperplasia	4	8	13	6	2	0	33 **(10.3%)**
Adenomyosis	2	13	18	5	2		40 **(12.5%)**
Adenomyosis with leiomyoma	1	2	5	1	0	0	9 **(2.8%)**
Leiomyoma	5	15	22	2	1	0	45 **(14.1%)**
Endometrial polyp	1	4	5	1	0	0	11 **(3.4%)**
Carcinoma of endometrium	0	0	0	1	1	0	2 **(0.6%)**
Inadequate sample	2	1	1	1	1	0	6 **(1.9%)**
Total	42	92	127	41	16	2	320 **(100%)**

Out of 7 cases of endometritis, 6 cases (85.7%) were of chronic endometritis and 1 case (14.3%) of tubercular endometritis. A total of 311 cases, 33 cases were endometrial hyperplasia. Out of 33 cases, hyperplasia without atypia constitutes 28 (84.8%) and atypical hyperplasia constitutes 5 cases (15.2%).

DISCUSSION

Abnormal uterine bleeding (AUB) remains a significant health concern, particularly in developing countries, where a large proportion of women suffer from anemia as a consequence. Managing AUB is a challenge for gynecologists, especially given the multifactorial nature of its etiology. Recent research has explored molecular contributors such as altered expression of bone morphogenetic proteins (BMPs), with BMP7 emerging as a potential target for future diagnostic and therapeutic strategies.[11]

This study aimed to evaluate the prevalence and pattern of endometrial lesions in AUB, thereby facilitating better diagnostic and management approaches. The most affected age group in our study was 41–50 years (40.5%), consistent with findings reported in several other studies.[12–14] Comparable age distributions have been noted by Bhatta S. et al. (39.34%), Sandeepa S. et al. (76.72%), Mahapatra M. et al. (38%), Rajagopal I. et al. (48.5%), and Sharma R. et al. (47.5%).[15–19]

Menorrhagia was the most common clinical presentation in our study, observed in 157 patients (50.7%), similar to findings by Mahapatra M. et al. and Rajagopal I. et al.[18–19] Among cyclic endometrial patterns, proliferative endometrium was the most frequently encountered (115 cases, 35.9%). This finding aligns with studies by Sharma R. et al. (38.8%), Sandeepa S. et al. (38.99%), and Mahapatra M. et al. (45.7%), though Rajagopal I. et al. reported a much lower incidence (8.9%).[16–19]

Leiomyoma was the second most common pathology in our study (45 cases, 14.1%), with the majority of patients aged 31–40 years. Similar findings were reported by Ramachandran T. et al. (22.9%), while V.R. SR et al. noted a higher prevalence of 54%.[20–21]

Endometrial hyperplasia, identified in 33 cases (10.3%), was most common in the 31–40 age group. Our findings are comparable to Sharma R. et al. (12.0%) but are lower than those reported by Sandeepa S. et al. (37.1%) and Rajagopal I. et al. (22.6%).[16–18] This condition is clinically significant, as it can be a precursor to endometrial carcinoma and warrants close follow-up.[20]

Atrophic endometrium was observed in 18 cases (5.6%), particularly among postmenopausal women. This is consistent with studies by Sharma R. et al., Sandeepa S. et al., and Mahapatra M. et al.[16–19] Though typically associated with aging, atrophy may also be linked to nutritional deficiencies in perimenopausal women. Diagnostic features include cystically dilated glands and a collagenized stroma. Reported prevalence in Indian studies ranges from 1.3% to 24.5%.[21–22]

Chronic endometritis, which has associations with infertility and poor socioeconomic status, was diagnosed in 7 cases (2.2%). One of these exhibited necrotizing granulomatous inflammation with Langhans-type giant cells and caseous necrosis, suggesting a tubercular etiology. Chronic endometritis should be considered during evaluation of persistent vaginal discharge.[23]

Endometrial polyps were detected in 11 cases (3.4%), mostly in reproductive and perimenopausal women. One unusual case of hemangiomatous polyp was reported in a 39-year-old patient. Previous studies have reported polyp prevalence rates ranging from 4.1% to 12%.[12,22,24] These benign growths are often hormonally influenced and may display disordered architecture due to anovulatory cycles. Elevated expression of TGFB2 and ligand 18 may play a role in their development.

Endometrial carcinoma was diagnosed in 2 cases (0.6%), which aligns with the findings of Mahapatra M. et al. (0.7%).[17] Known risk factors include nulliparity, obesity, diabetes, hypertension, and smoking. While adenocarcinoma is the most common histological subtype, other variants such as sarcomas and squamous cell carcinomas have been reported. Malignant transformation of polyps and rare tumors like malignant

mixed Müllerian tumors have also been documented.[12,25] In some cases, cervical carcinoma may extend into the endometrium, presenting as abnormal vaginal bleeding.[20] The rising use of pipelle endometrial biopsy is noteworthy, as it is a safer, less invasive alternative to D&C, without compromising diagnostic accuracy.[27]

CONCLUSION

Abnormal uterine bleeding is a significant gynecological issue with wide-ranging etiologies, particularly prevalent in perimenopausal women. Judicious use of hormonal therapy is advised, as indiscriminate treatment may lead to complications such as endometrial hyperplasia or disordered proliferative patterns. Histopathological examination of endometrial tissue remains essential for accurate diagnosis and effective management. Early identification and classification of lesions, particularly in high-risk age groups, can aid in timely intervention and prevention of malignancy.

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