RESEARCH PAPER

Histological Insights Into Endometrial Changes In Postmenopausal Women Hysterectomy Comes In Tertiary Care Centre

Ms. Anamika Tiwari[1*], Dr. Aditi Bhatnagar[2*], Dr. Amrita Bharti[3], Dr. Anshu Gupta Devra[4], Dr. Rachna Rohatgi[5], Dr. Nirupma Gupta[6]

[1*]3rd year Student, M.Sc. Medical Anatomy, Department of Anatomy, Sharda School of Medical Sciences & Research, Greater Noida
[2]Professor, Department of Anatomy, Sharda School of Medical Sciences & Research, Greater Noida
[3]Associate Professor, Department of Anatomy, Sharda School of Medical Sciences & Research, Greater Noida
[4]Professor &HEAD, Department of Pathology, Sharda School of Medical Sciences & Research, Greater Noida
[5]Professor & HEAD, Department of Anatomy, Sharda School of Medical Sciences & Research, Greater Noida
[6]Professor & DEAN, Department of Anatomy, Sharda School of Medical Sciences & Research, Greater Noida

Corresponding Author
Dr. Aditi Bhatnagar
Professor, Dept Of Anatomy, Sharda School of Medical Sciences and Research
aditi.bhatnagar@sharda.ac.in

ABSTRACT

BACKGROUND - The endometrium undergoes significant structural and functional changes after menopause due to declining hormonal activity. Histopathological evaluation of hysterectomy specimens plays an important role in identifying benign, premalignant, and malignant lesions in postmenopausal women. **AIM -** To evaluate the histopathological patterns of the endometrium in postmenopausal women undergoing hysterectomy and to correlate these findings with endometrial thickness (ET) and clinical presentation. **MATERIALS AND METHODS -** This cross-sectional histological study was conducted in the Department of Anatomy, Sharda School of Medical Sciences & Research, Sharda University, Greater Noida, over a period of one year from January 2025 to December 2025. A total of 207 hysterectomy specimens from postmenopausal women were included in the study. Clinical history, menopausal status, bleeding pattern, and ultrasonographic findings were recorded. Specimens were processed routinely and stained with hematoxylin and eosin (H&E) for histopathological examination. Endometrial patterns including atrophy, proliferative changes, hyperplasia, carcinoma, polyps, and inflammatory lesions were analyzed. **RESULTS -** The majority of patients belonged to the 51–60 years age group (45.4%). Atrophic endometrium was the most common histopathological finding (34.3%), followed by proliferative endometrium (28.0%), endometrial hyperplasia (11.1%), and endometrial carcinoma (10.6%). Most carcinoma cases were Type I endometrioid carcinoma (72.7%). The majority of women showed an ET of 4.1–8 mm, whereas ET ≥16 mm showed the strongest association with malignancy, with 85.7% of cases diagnosed as carcinoma. Hyperplastic and proliferative patterns were more frequently associated with increasing ET. **CONCLUSION -** Atrophic endometrium was the predominant histopathological finding in postmenopausal women; however, a significant proportion showed premalignant and malignant lesions. Increasing endometrial thickness demonstrated a strong association with malignancy. Combined assessment of clinical presentation, ultrasonographic ET measurement, and histopathological examination remains essential for the early detection and management of endometrial pathology in postmenopausal women.

Keywords: Histopathology, Hysterectomy, Endometrial thickness, Endometrial hyperplasia, Atrophic Endometrium, Postmenopausal bleeding.

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Author for Correspondence:* **Dr. Aditi Bhatnagar

INTRODUCTION

The uterus is a hollow, thick-walled muscular organ situated in the female pelvis between the urinary bladder anteriorly and the rectum posteriorly. It is a principal component of the female reproductive system and is responsible for menstruation, implantation, fetal development, and parturition. Anatomically, the uterus is divided into four regions: the fundus, body (corpus), isthmus, and cervix. The uterine wall is composed of three layers—endometrium, myometrium, and perimetrium—each having distinct structural and functional significance[1]. The endometrium is a hormonally responsive mucosal lining that undergoes cyclical changes during the reproductive years, while the myometrium consists of smooth muscle fibers responsible for uterine contractions[2].

The uterus receives its blood supply mainly from the uterine arteries, branches of the internal iliac arteries, and is supported by pelvic ligaments including the broad, round, uterosacral, and cardinal ligaments. Histologically, the endometrium exhibits cyclic proliferative, secretory, and menstrual changes under the influence of estrogen and progesterone[3]. After menopause, due to decreased ovarian hormonal activity, the endometrium usually becomes thin and atrophic. However, postmenopausal women are at increased risk of developing various pathological conditions such as endometrial hyperplasia, polyps, adenomyosis, and endometrial carcinoma [4,5].

Histopathological examination of hysterectomy specimens provides detailed insight into these uterine and endometrial alterations and remains the gold standard for diagnosis. Correlation of microscopic findings with clinical symptoms, particularly postmenopausal bleeding, is essential for early detection of premalignant and malignant lesions [6,7]. Therefore, this study aims to evaluate the spectrum of histopathological changes in the uterus and endometrium in postmenopausal women undergoing hysterectomy and to emphasize their anatomical and clinical significance in gynecological practice.

MATERIAL AND METHODS

This cross-sectional histological study was conducted in the Department of Anatomy, School of Medical Sciences & Research, Sharda University, Greater Noida, Uttar Pradesh, over a period of one year from January 2025 to December 2025. The study aimed to analyse the histopathological changes in the endometrium of postmenopausal women undergoing hysterectomy, evaluate the spectrum of endometrial pathologies, and correlate the histological findings with clinical presentation. A total of 207 hysterectomy specimens obtained from postmenopausal women were included in the study.

Postmenopausal women undergoing hysterectomy for uterine pathology were included, while autolysed specimens, ovarian tumours, active uterine infections, and women receiving menopausal hormone therapy were excluded from the study. Detailed clinical history, menopausal status, bleeding pattern, and ultrasonographic findings were recorded for all patients.

The hysterectomy specimens were grossly examined and fixed in formalin, followed by routine tissue processing, paraffin embedding, sectioning, and staining with hematoxylin and eosin (H&E). Histopathological examination was performed to identify endometrial atrophy, hyperplasia, carcinoma, polyps, adenomyosis, fibroids, and inflammatory lesions. The histological findings were analysed and correlated with the clinical features of the patients.

RESULT

The findings obtained from the histopathological evaluation of 207 postmenopausal women who underwent hysterectomy at a tertiary care center. The results are organized into demographic parameters, clinical presentations, uterine findings, and detailed endometrial histopathological patterns.

1.1 Age Distribution

The age distribution reflects that most hysterectomies among postmenopausal women occur in the 51–60-year age group, with the next highest proportion belonging to women aged 61–70 years.

1.2 Distribution of endometrial thickness among various histopathological patterns.

Table:1.1 Distribution of endometrial thickness among various histopathological patterns.

ET (mm)	Total	Proliferative	Disordered Proliferative	Secretory	Hyperplasia	Atrophic	Carcinoma
1–4 mm	40	10	0	0	0	8	4
4.1–8 mm	97	50	24	19	40	8	0

8.1–12 mm	80	13	14	5	21	10	10
12.1–16 mm	22	0	3	1	2	5	0
≥16 mm	7	0	0	0	1	0	6
TOTAL	207	65	41	25	64	31	20

Interpretation: - Among the 207 postmenopausal women, the most common endometrial thickness (ET) range was 4.1–8 mm (46.8%). Atrophic endometrium was mainly associated with ET of 1–4 mm, while proliferative and hyperplastic changes were more common in the 4.1–12 mm range. Cases with ET ≥16 mm showed the highest incidence of malignancy, indicating a strong association between increasing ET and premalignant or malignant endometrial lesions.

1.3 Histopathological Patterns of the Endometrium

Table: - 1.2 Histopathological Patterns of the Endometrium

Histopathological Pattern	Number of Patients	Percentage (%)
Endometrial polyp	13	6.3%
Atrophic endometrium	71	34.3%
Proliferative endometrium	58	28.0%
Secretory endometrium	12	5.8%
Endometrial hyperplasia	23	11.1%
Atypical hyperplasia (EIN)	8	3.9%
Endometrial carcinoma	22	10.6%

Interpretation: -

- **Atrophic endometrium** is the most common finding. (Fig:1.1)
- **Proliferative changes** were also frequent, indicating hormonal influence even post-menopause (exogenous or endogenous oestrogen).
- **Endometrial carcinoma** was detected in **10.6%** of cases—highlighting the importance of histopathology

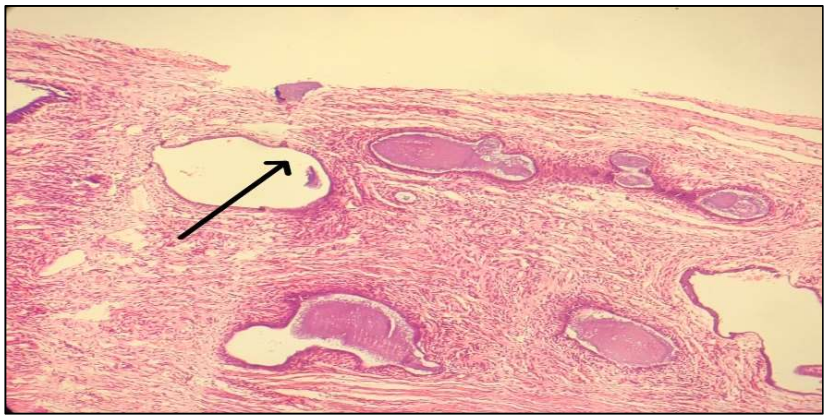

Fig 1.1: Showing Atrophic Endometrial **(Black Arrow) (H & E X10)**.

1.4: Types of Endometrial Hyperplasia

Table 1.3: Types of Endometrial Hyperplasia - Among the 23 hyperplasia cases**:**

Type of Hyperplasia	Cases	Percentage (%)
Simple hyperplasia	14	60.8%
Complex hyperplasia	9	39.2%

Interpretation - Simple hyperplasia was more common than complex hyperplasia. (Fig:1.2)

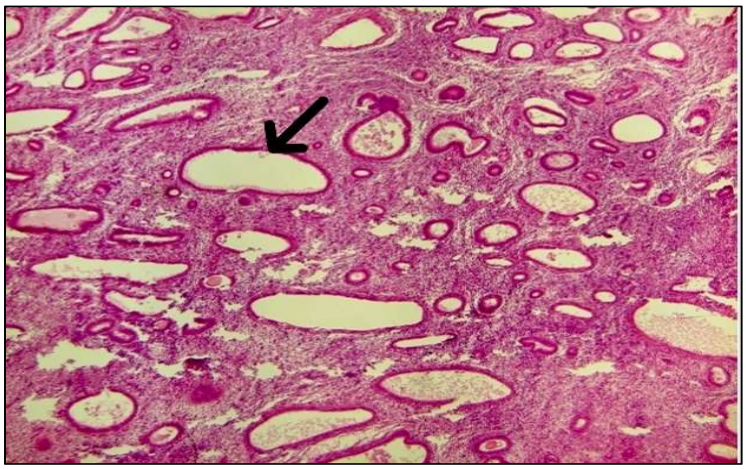

Fig 1.2: Showing Complex Endometrial Hyperplasia **(Black Arrow) (H & E X10)**.

1.5 Types of endometrial carcinoma: Among 22 carcinoma cases

Table 1.4: Type of Endometrial Carcinoma

Type of Carcinoma	Cases	Percentage (%)
Endometrioid (Type I)	16	72.7%
Serous carcinoma (Type II)	4	18.1%
Clear cell carcinoma	2	9.2%

Interpretation - Majority were **Type I (endometrioid carcinoma),** consistent with oestrogen – dependent diseases pathology.

The findings of this study indicate that endometrial thickness, age, and histopathological patterns are important predictors of uterine pathology in postmenopausal women. Most cases were observed in the 51–60-year age group and within an endometrial thickness range of 4.1–8 mm, while thickness ≥16 mm showed a strong association with malignancy. Atrophic endometrium was the most common histological finding; however, the presence of endometrial carcinoma in 10.6% of cases highlights the importance of routine histopathological evaluation. The predominance of simple hyperplasia and Type I endometrioid carcinoma further supports the role of estrogen-related changes in postmenopausal endometrial pathology. Combined assessment of endometrial thickness and histopathology remains valuable for early detection of premalignant and malignant lesions.

DISCUSSION

The present study evaluated the histopathological patterns of the endometrium in 207 postmenopausal women undergoing hysterectomy. The findings were analysed with respect to age distribution, endometrial thickness (ET), and various endometrial pathologies, and were compared with previously published studies.

Most cases were observed in the 51–60 years age group, which is consistent with both Indian and international studies reporting a higher incidence of postmenopausal uterine pathology during the sixth decade of life[8].Postmenopausal bleeding was the most common presenting symptom, emphasizing the importance of careful evaluation in this age group.Atrophic endometrium was the most common histopathological finding, reflecting the effect of estrogen deficiency after menopause. However, a considerable proportion of cases also showed proliferative endometrium, hyperplasia, and carcinoma, indicating that significant pathological changes may still occur in postmenopausal women [(9,10)]. The prevalence of hyperplasia and atypical hyperplasia in the present study was comparable to previously reported literature and remains clinically important because of its premalignant potential. Endometrial carcinoma was identified in 10.6% of cases, which is similar to global reports[11].Endometrioid carcinoma was the predominant subtype, supporting the role of estrogen-related pathogenesis in postmenopausal malignancy. A strong correlation was also observed between increasing ET and the risk of malignancy. Most atrophic endometrium cases had an ET of 1–4 mm, whereas carcinoma was more frequently associated with ET ≥16 mm. These findings support the clinical usefulness of ultrasonographic ET measurement as an important screening tool in postmenopausal women[12].

Overall, the study highlights that histopathological examination remains the gold standard for the diagnosis of endometrial lesions. Combined assessment of clinical presentation, ET measurement, and histopathology is essential for the early detection of premalignant and malignant lesions in postmenopausal women[(13,14)].

Table 1.1: - Comparison of histopathology of endometrium in postmenopausal bleeding.

Study	Proliferative Endo (%)	Secretory Endo (%)	Atrophic Endo (%)	Hyperplasia (%)	Polyp (%)	Atypical Hyperplasia (EIN) (%)	Endometrial Carcinoma (%)
Gredmark (1995)	4.30	–	51.50	28	9.50	–	8.40
Escoffery (2002)	4	–	26.70	26.40	5.70	–	12
Naik (2005)	17	3.70	32	12.97	4.63	–	19
Pragati (2013)	13	2	41	6	12	–	13
Krishnani (2018)	32	2	40	–	12	–	6
Present Study (2025)	**28.0**	**5.8**	**34.3**	**11.1**	**6.3**	**3.9**	**10.6**

CONCLUSION

In this cohort of 207 postmenopausal women undergoing hysterectomy, the most common endometrial histopathology was **atrophic endometrium (34.3%)**, followed by proliferative endometrium (28.0%),

hyperplasia (11.1%), and endometrial carcinoma (10.6%). The majority of carcinomas were of the Type I (endometrioid) variety (72.7%), with smaller proportions of serous and clear-cell cancers. A clear **positive correlation between increasing endometrial thickness (ET) and pathologic proliferation/malignancy** was observed: notably, among women with ET ≥16 mm, 85.7% had carcinoma. These findings reinforce that while benign changes (atrophy, inactive endometrium) are common in postmenopausal women, a substantial fraction harbors premalignant or malignant lesions. Therefore, postmenopausal endometrial evaluation should not be ignored even in the absence of dramatic symptoms.

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