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Research Article

Clinicopathological Analysis Of Hysterectomy Specimens - A Retrospective Study At A Tertiary Care Centre In North India

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ABSTRACT

Abstract: The uterus is a hormonally responsive reproductive organ that undergoes a wide range of physiological changes and is susceptible to numerous benign and malignant pathologies. Common benign conditions include abnormal uterine bleeding (AUB), pelvic inflammatory disease (PID), uterine prolapse, adenomyosis, endometriosis, and leiomyomas. Although several treatment modalities exist, hysterectomy remains a prevalent surgical option globally for both benign and malignant condition affecting the female reproductive tract. Histopathological evaluation of hysterectomy specimens is essential for definitive diagnosis and optimal patient management.

Aims and Objectives: -The present study aimed to evaluate the various clinical indications for hysterectomy, assess the correlation between preoperative clinical diagnoses and final histopathological findings, and to analyze the spectrum of histomorphological lesions observed in hysterectomy specimens.

Materials and Methods: A retrospective analysis of 155 hysterectomy specimens was conducted over one year at the Department of Pathology, Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh. All specimens, including total abdominal and vaginal hysterectomies, were processed and stained with hematoxylin and eosin (H&E) for microscopic evaluation. Histopathological observation from the endometrium, myometrium, cervix, ovaries, and fallopian tubes were documented and correlated with clinical data.

Results: Abdominal hysterectomy was the most common performed surgical procedure performed among 155 analyzed cases (83.9%), with the highest incidence in women aged 41–50 years (45.2%). Abnormal uterine bleeding due to leiomyoma (AUB-L) was the most prevalent clinical indication (45.8%), followed by Adenomyosis (AUB-A) in 22.6% of cases. Proliferative endometrium was the predominant endometrial pattern (38.7%), while leiomyoma (44.5%) and adenomyosis (20.6%) were the most frequent myometrial findings. Hyalinization was the most frequent degenerative change observed in leiomyomas (13.6%). Chronic cervicitis was the most frequent incidental cervical finding (51%). Follicular cysts were the most common ovarian lesions (15.6%).2.2% cases each of serous cystadenoma and mucinous cystadenoma were also noted. Malignancies included endometrial carcinoma (1.3%), cervical carcinoma (2.6%), and ovarian carcinomas (2.2% each for serous and mucinous subtypes). A strong clinicopathological correlation was observed in 70–100% of cases. Rare entities such as cellular, epithelioid, lipoleiomyoma, vascular leiomyoma and serous tubular intraepithelial lesion (STIL) were also documented.

Conclusion: Hysterectomy remains the cornerstone surgical treatment for various gynecological conditions. Usually there is generally a strong correlation between clinical and histological diagnosis, coexisting or incidental pathologies (chronic cervicitis & adenomyosis) and occult malignancies are often detected only through microscopic evaluation. Therefore, histopathological examination is essential for definitive diagnosis and is crucial for optimal postoperative management.

Keywords: Hysterectomy, Endometrium, Myometrium, Cervix, Histopathological correlation.

INTRODUCTION

The female genital tract comprises the uterine corpus and cervix, with the corpus further divided into the endometrium and myometrium.[1] The uterus, a crucial hormone-responsive reproductive organ, is prone to various benign and malignant pathologies.[2] Under hormonal regulation, the endometrial lining undergoes cyclical shedding. Lesions affecting the uterine corpus and cervix are among the most frequent reasons for gynecological consultation.[3]

These conditions are predominantly observed in middle-aged and elderly women. Common clinical manifestations include abdominal pain, abnormal uterine bleeding (AUB), postmenopausal bleeding, vaginal discharge, and the presence of a pelvic mass or uterine prolapse. Although conservative medical and hormonal therapies are often employed initially, hysterectomy continues to be a widely adopted definitive treatment in cases where other options prove ineffective.

Hysterectomy involves the surgical removal of the uterus and cervix, sometimes also including unilateral or bilateral related organs like ovaries or fallopian tubes. The first subtotal hysterectomy was performed by Charles Clay in Manchester, England, in 1843, while the first total abdominal hysterectomy was conducted in 1929.[4].

This procedure can be carried out via abdominal, vaginal, or laparoscopic approaches, with or without salpingo-oophorectomy. Laparoscopic methods are increasingly preferred due to their minimally invasive nature, faster recovery, and better cosmetic outcomes.

Menstrual irregularities and heavy bleeding account for approximately 25%–33% of gynecological outpatient visits. AUB, defined as any abnormal variation in the frequency, regularity, volume, or duration of menstrual bleeding, is a significant health concern.[5]. It affects 14%–25% of women in the reproductive age group, with prevalence rising to 50% in perimenopausal women.[6] In India, the reported prevalence of AUB is around 17.9%, often leading to complications such as severe anemia that may necessitate surgical intervention.[7]

The most frequent indication for hysterectomy is AUB, commonly associated with uterine pathologies such as prolapse, leiomyoma, adenomyosis, and endometriosis.[8] To classify AUB based on etiology, the PALM–COEIN system categorizes the causes of AUB:PALM refers to structural causes like Polyp, Adenomyosis, Leiomyoma, Malignancy and Hyperplasia; COEIN refers to non-structural causes such as Coagulopathy, Ovulatory dysfunction, Endometrial, Iatrogenic, and Not yet classified.[9]

AIMS AND OBJECTIVE

The study aims to evaluate the spectrum of histomorphological lesions observed in hysterectomy specimens. Additionally, the study seeks to correlate these findings with the patient's age and their respective clinical presentations, enhancing diagnostic accuracy and improve clinicopathological understanding of uterine pathology in a tertiary care setting.

MATERIALS AND METHODS

This one year retrospective observational study was conducted in the Department of Pathology at Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh included 155 hysterectomy specimens, obtained for various gynecological indications.

All specimens were received in the histopathology laboratory, properly labeled, and immediately fixed in 10% buffered formalin at a 1:10 specimen-to-fixative volume ratio. After adequate fixation for 8–10 hours, a thorough gross examination of each specimen was performed. Representative tissue sections were taken from the cervix, endometrium, myometrium, ovaries, and fallopian tubes. The tissues underwent processing using standard histological techniques, including embedding and sectioning at 2–5 µm thickness. The resulting sections were stained with hematoxylin and eosin (H&E) and examined microscopically.

Histopathological findings from cervix, endometrium, myometrium, ovaries and fallopian tubes of every hysterectomy specimen were noted and subsequently correlated with the patients clinical presentation and age.

Inclusion Criteria

- All hysterectomy specimen (total and subtotal) regardless of whether they included bilateral or unilateral salpingo-oophorectomy, were included in the study.

Exclusion Criteria

- Specimens from patients with a preoperative confirmed diagnosis of malignancy.
- Endometrial and cervical biopsy samples (i.e.,specimens other than complete hysterectomy specimens)

We analyzed all 155 hysterectomy specimens and findings were summarized in the following tables are based on the observations made histopathologically.

The highest incidence was shown in the 41–50 years age group (70 cases, 45.2%), followed by the 31–40 years group (52 cases, 33.5%) **(Figure-1)**

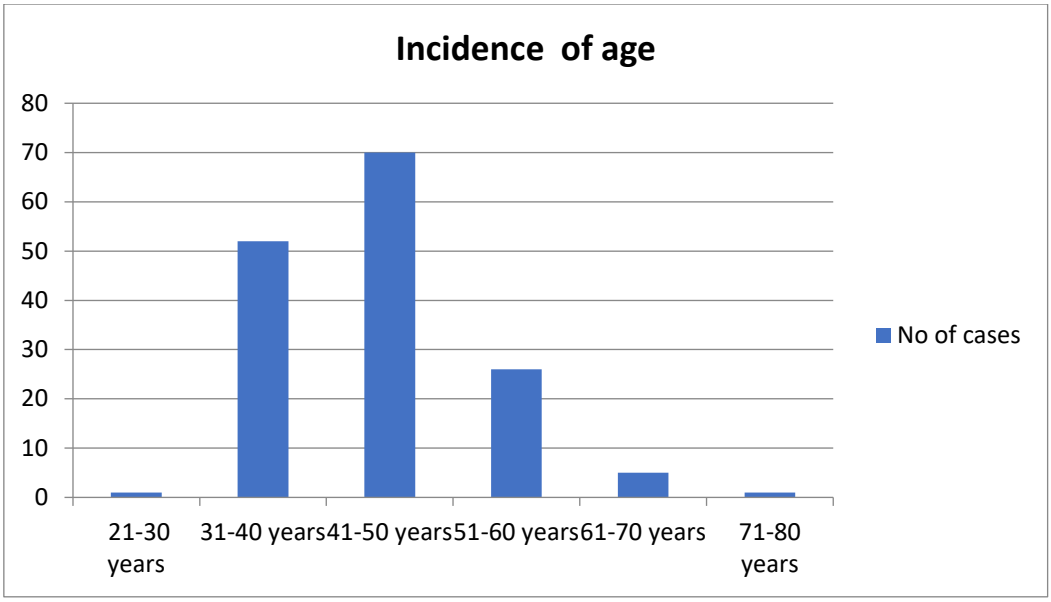

Figure 1: Age –wise distribution of hysterectomy specimen (N=155)

The most common indication was AUB due to Leiomyoma (71 cases, 45.8%), followed by adenomyosis (35 cases, 22.6%), utero-vaginal prolapse (20 cases, 12.9%) and ovarian cystic lesions/tumor (13 cases, 8.4%) . Other indications included endometrial polyps (9 cases, 5.8%) and endometrial malignancy/hyperplasia accounting for 7 cases (4.5%) **(Table 1).**

Table.1 Clinical Indication of hysterectomy (N=155)

S.N	Indication	Number of cases	Percentage (%)
1.	AUB-Leiomyoma	71	45.8%
2.	AUB-Adenomyosis	35	22.6%
3.	AUB-Endometrial polyp	9	5.8%
4.	AUB-Endometrial hyperplasia/Malignancy	7	4.5%
5.	Utero-vaginal prolapse	20	12.9%
6.	Ovarian cyst /Tumor	13	8.4%
	Total	155	100%

The most common procedure performed was total abdominal hysterectomy with adnexal preservation (65 case, 41.9%). This was followed by total abdominal hysterectomy with bilateral salpingo-oophorectomy, (50 cases 32.3%) **(Figure-2)**

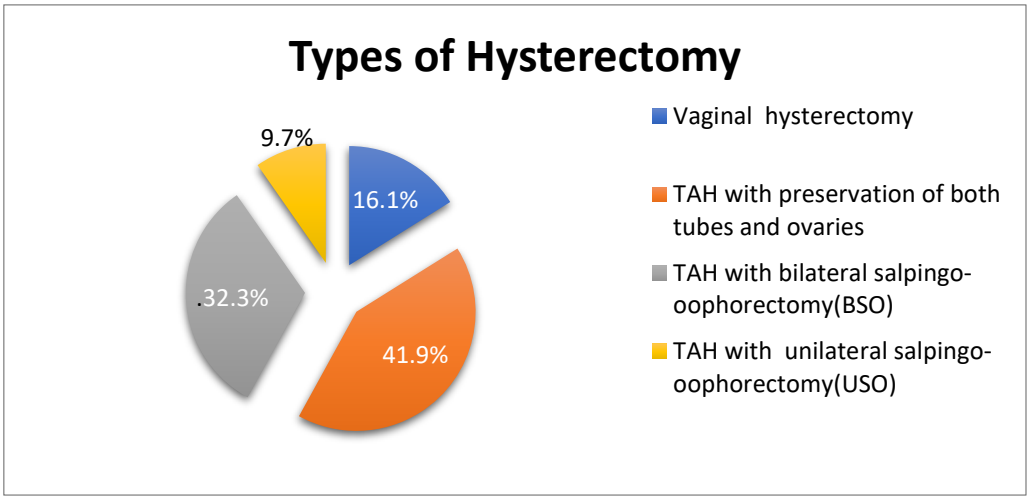

Figure 2: Distribution of Hysterectomy cases

The most prevalent histopathological pattern of the endometrium was the proliferative phase, identified in 60 cases (38.7%), followed by atrophic endometrium in 37 cases (23.9%). Other findings included the secretory phase in 21 cases

(13.5%), disordered proliferative endometrium in 19 cases (12.2%), endometrial polyps in 7 cases (4.5%), and pill endometrium in 3 cases (1.9%). Less frequent findings included hyperplastic changes specifically simple hyperplasia (0.7%) and complex hyperplasia with atypia (1.3%). Endometrial stromal nodule and Low grade Endometrial stromal sarcoma were each found in one cases. Endometrial adenocarcinoma was identified in two cases (1.3%) **(Table 2) (Figures-3,4 &5)**

Table-2. Distribution of histopathological findings in endometrium (N=155)

S.N	Histopathological findings	Number of cases	Percentage (%)
1.	Proliferative Endometrium	60	38.7%
2.	Secretory Endometrium	21	13.5%
3.	Disorderd proliferative Endometrium	19	12.2%
4.	Atrophic Endometrium	37	23.8%
5.	Endometrial Polyp	07	4.5%
6.	Endometritis	01	0.7%
7.	Pill Endometrium	03	1.9%
8.	Endometrial stromal nodule	01	0.7%
9.	Low grade Endometrial stromal sarcoma	01	0.7%
10.	Simple Hyperplasia	01	0.7%
11.	Complex Hyperplasia	02	1.3%
12.	Carcinoma Endometrium	02	1.3%
	Total	155	100%

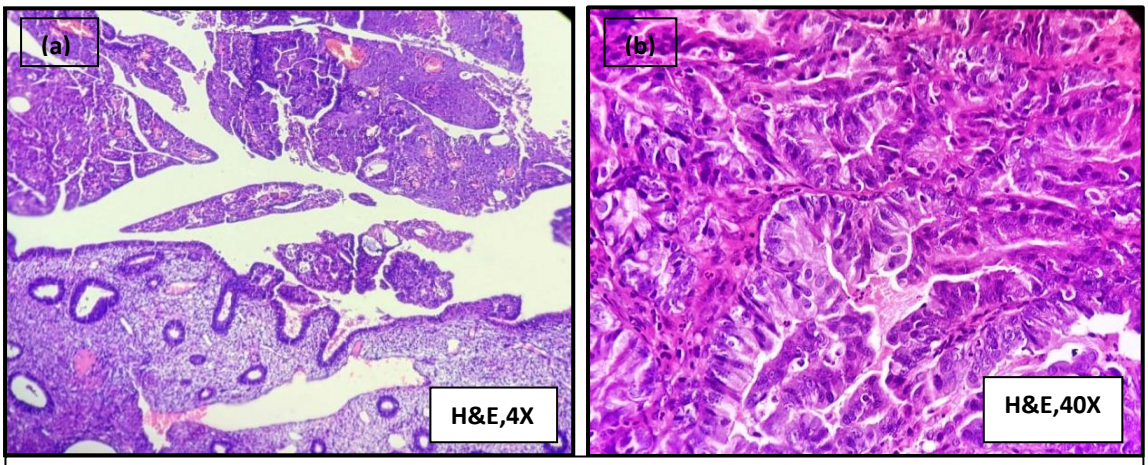

Fig.3 (a) Endometrium. Endometrioid adenocarcinoma showing complex and papillary arrangement of glands (b) A higher magnification photomicrograph showing nuclear pleomorphism and hyperchromasia in glands.

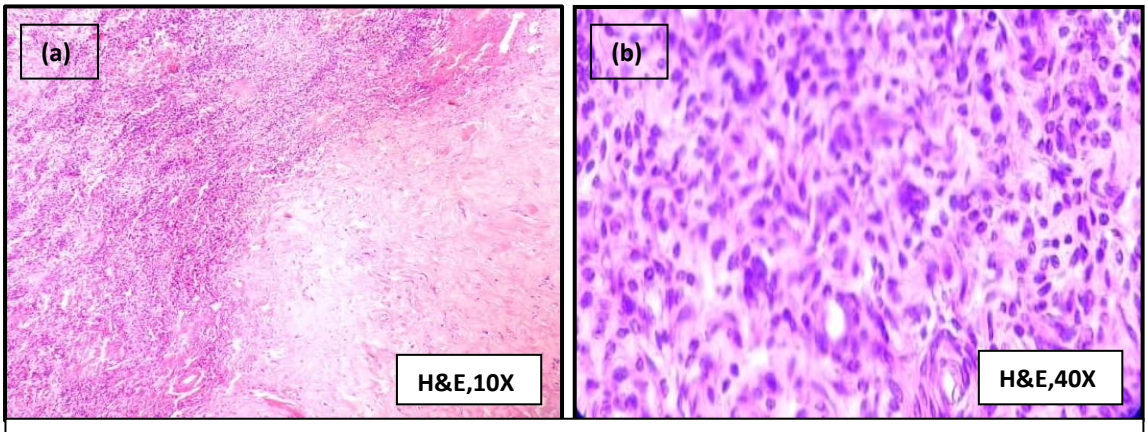

Fig.4 (a)Endometrium. Endometrial stromal nodule showing well demarcated tumor-myometerial interface (b) A higher magnification photomicrograph showing proliferation of bland endometrial stromal cells around small arterioles.

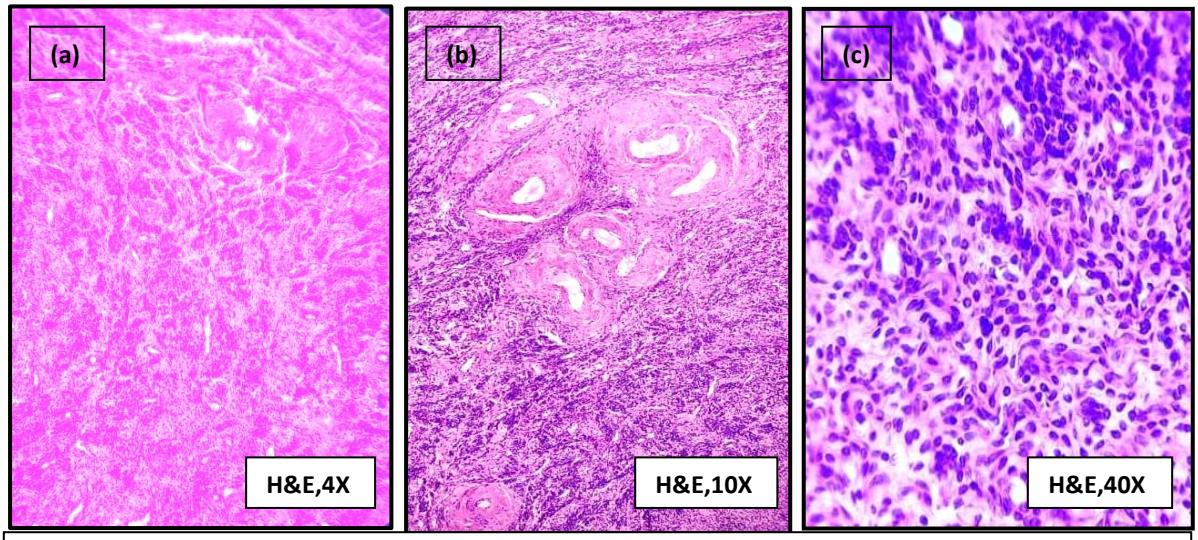

Fig.5 (a,b)Endometrium. Low grade endometrial stromal sarcoma-Irregular islands of neoplastic stromal cells invading the myometrium in tongue like pattern.(c)) A higher magnification photomicrograph showing proliferations of endometrial stromal cells with minimal nuclear atypia.

Leiomyoma was the most frequent myometrial pathology identified in 69 cases (44.5%).Adenomyosis was observed in 32 cases (20.6%), while 20 cases (12.9%) presented with both leiomyoma and adenomyosis.. The remaining 34 cases (22%) exhibited no significant pathological changes**.(Table-3)(Figure-6)**

Table 3: Distribution of histopathological findings in myometrium (N=155)

S.N	Histopathological findings	Number of cases	Percentage (%)
1.	Leiomyoma	69	44.5%
2.	Adenomyosis	32	20.6%
3.	Leiomyoma+ Adenomyosis	20	12.9%
4.	Unremarkable	34	22%
	Total	155	100%

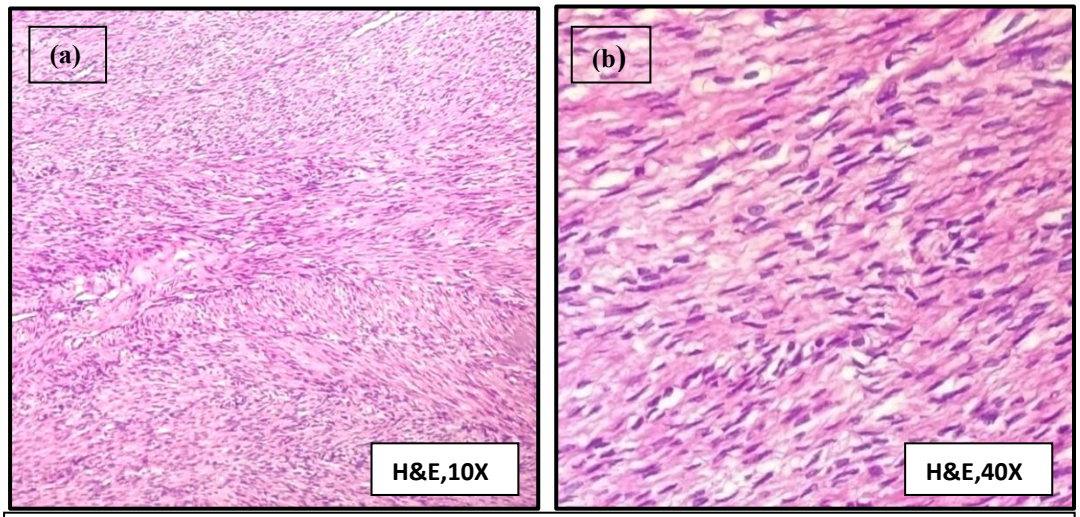

Fig.6 (a) Myometrium. Leiomyoma-Intersecting bundles (fascicles) of spindle shaped cells.(b) A higher magnification photomicrograph showing spindle cells have oval to cigar shaped bland nuclei.

Site Distribution of Leiomyoma:
The most frequent location was intramural (92 cases,59.4%), followed by subserosal (52 cases, 33.5%) **(Table.4)**

Table.4 Site Distribution of Leiomyoma

S.N	Site wise distribution of leiomyoma	Number of cases	Percentage (%)
1.	Intramural	92	59.4%
2.	Submucosal	11	7.1%
3.	Subserosal	52	33.5%
	Total	155	100%

Pathological changes in leiomyomas:
120 cases of typical leiomyomas (77.4%), followed by degenerative changes in 31 cases (20%) and four variants of leiomyoma (2.6%) **(Figure-7)**

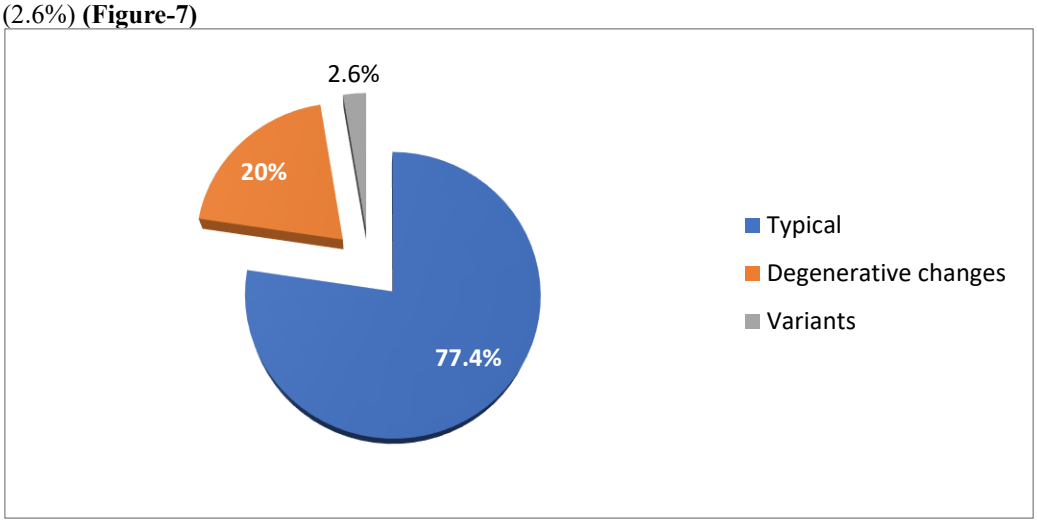

Figure 7:Various pathological changes in leiomyoma

Degenerative changes: were observed in 20% of leiomyomas, with hyalinization being most common (13.6%). **(Figure-8)**

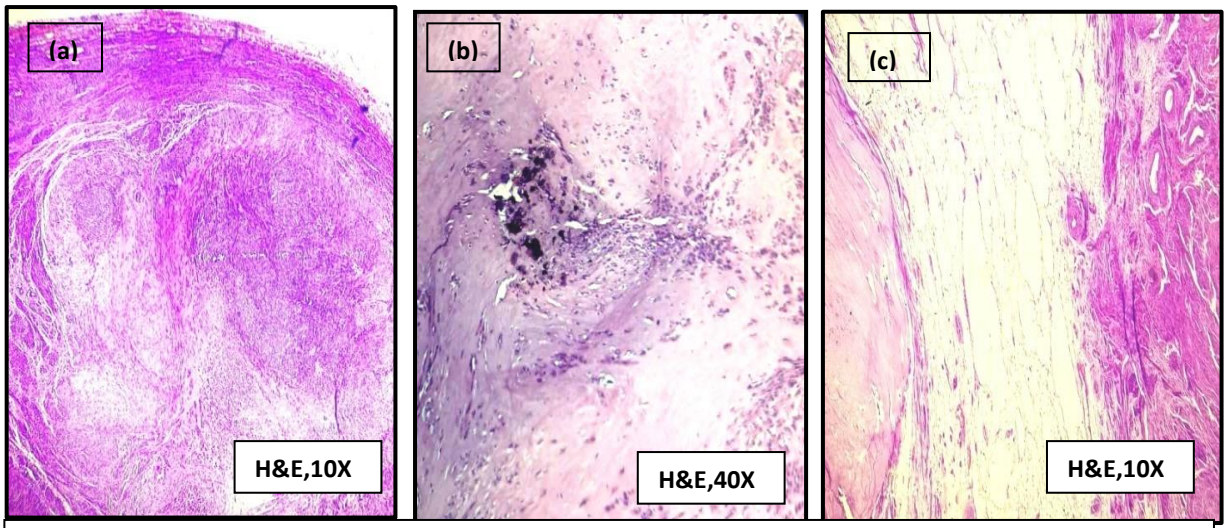

Fig.8 Myometrium with secondary changes . (a) Hyaline changes with lipoleiomyoma (b) A higher magnification photomicrograph showing hyaline changes with calcification (c) Myxoid Leiomyoma – smooth muscle cells separated by myxoid matrix.

Unusual variants: identified included cellular, epithelioid, lipoleiomyoma, and vascular leiomyoma—each comprising 0.65% of cases.**(Figure -9)**

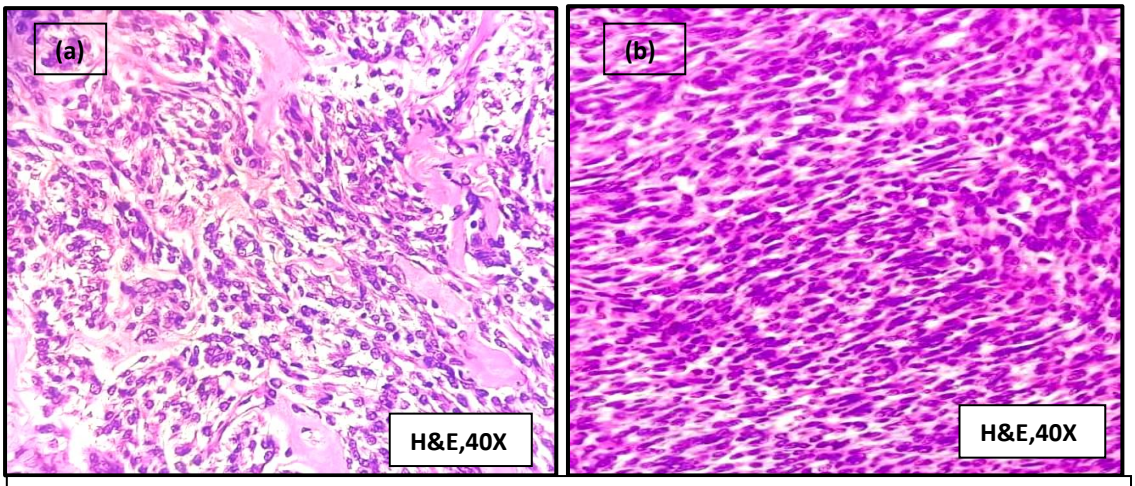

Fig.9 (a) Myometrium .Epithelioid leiomyoma- A higher magnification photomicrograph showing round or polyglonal cells with eosinophilic cytoplasm in nested or trabecular pattern. (b) Myometrium. Cellular leiomyoma- A higher magnification photomicrograph showing Increased cellularity with scant cytoplasm.

Age-wise analysis revealed a predominance of leiomyomas and adenomyosis in the 41–50 year age group (55% and 53.9%, respectively). **(Table-5)**

Table 5: Age -wise distribution of Leiomyoma & Adenomyosis

S.N	Age group	Leiomyoma (N=89)		Adenomyosis (N=52)	
		Number of cases	Percentage (%)	Number of cases	Percentage (%)
1.	21-30	01	1.2%	00	00.00%
2.	31-40	26	29.2%	13	25%
3.	41-50	49	55%	28	53.9%
4.	51-60	11	12.4%	10	19.2%
5.	61-70	02	2.2%	01	1.9%
6.	71-80	00	00.00%	00	00.00%

Chronic cervicitis constituted the predominant cervical pathology, diagnosed in 79 cases (51%). Other findings included chronic cervicitis with nabothian follicle in 42 cases (27%), and squamous metaplasia in 24 cases (15.5%). Cervical polyps and dysplasia each accounting for (1.3%), four cases of carcinoma (2.6%) were also diagnosed. Rare lesions included cervical leiomyoma (1.3%).(**Table-6 (Figures-10&11)**

Table-6 Distribution of histopathological findings in cervix (N = 155)

S.N	Histopathological findings	Number of cases	Percentage (%)
1.	Chronic cervicitis	79	51%
2.	Chronic cervicitis with nabothian follicle	42	27%
3.	Chronic cervicitis with squamous metaplasia	24	15.5%
4.	Cervical polyp	02	1.3%
5.	Cervical leiomyoma	02	1.3%
6.	Cervical dysplasia	02	1.3%
7.	Cervical cancer	04	2.6%
	Total	155	100%

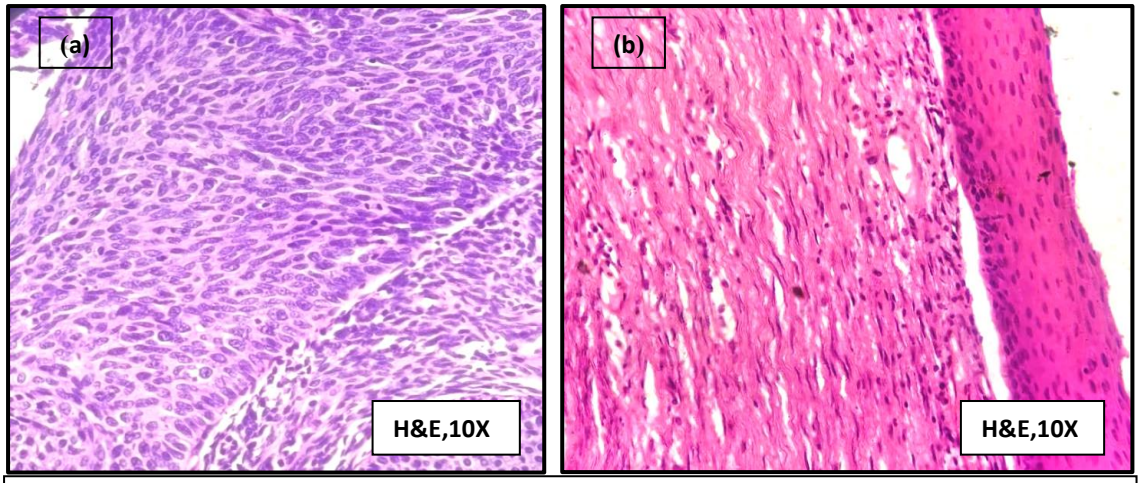

Fig. 10 (a) Cervix. HSIL -Shows full thickness nuclear atypia and lack of maturation (b) Cervix. Cervical leiomyoma –Spindle-shaped smooth muscle cells arranged in intersecting bundles or fascicles.

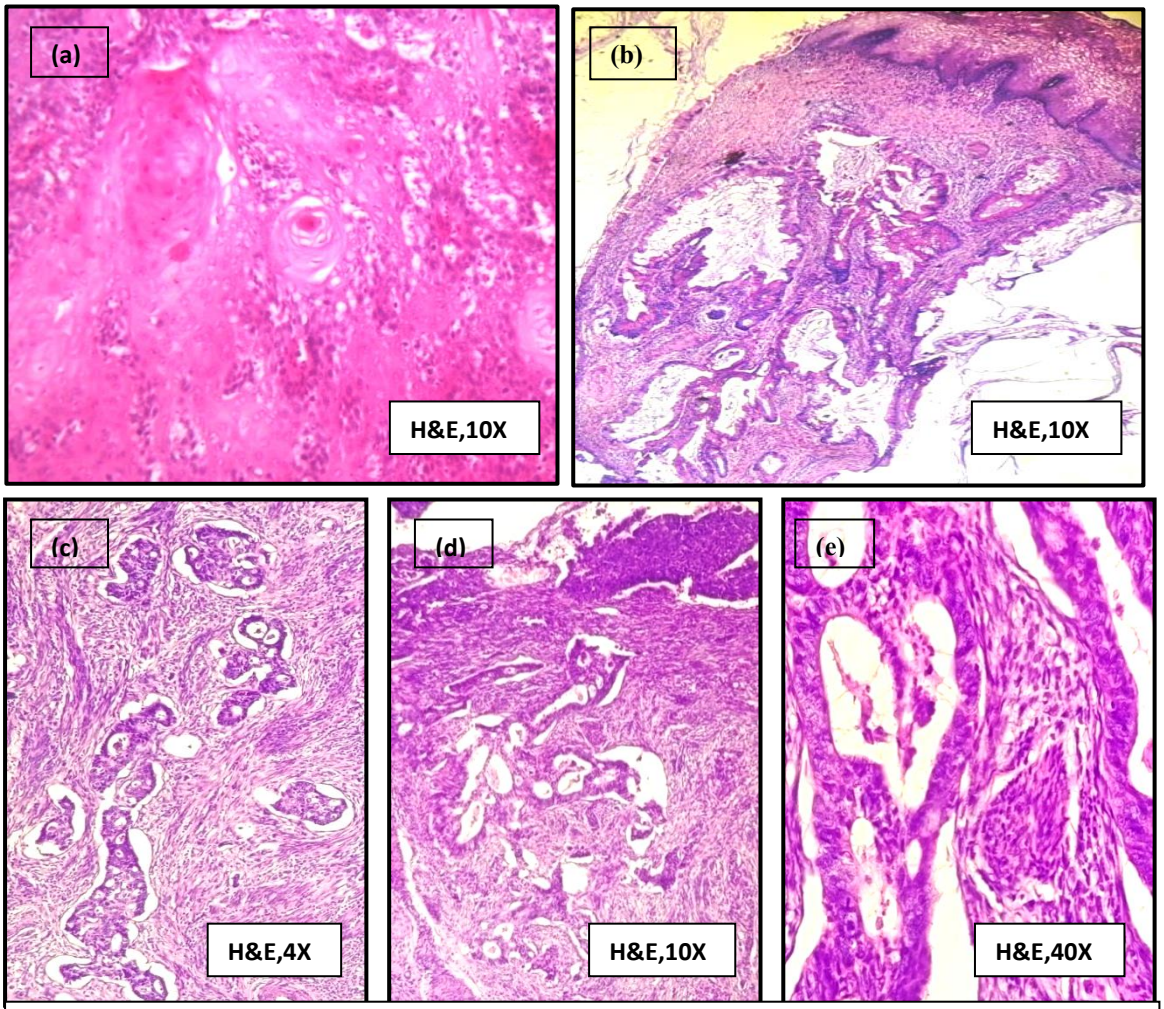

Fig.11(a) Cervix. Well differentiated Squamous cell carcinoma-Showing abundant keratinization of epithelium and minimal nuclear pleomorphism. (b) Cervix. Endocervical adenocarcinoma– Tumor shows variable sized closely packed glands floating in abundant mucin (c,d)) Cervix. Adenocarcinoma-Irregular, angulated or cribriform glands. (e) Cervix. Adenocarcinoma -A higher magnification photomicrograph showing glands lined by stratified nuclei.

Among the 90 cases where ovaries were available for examination, 52 cases (57.8%) showed no pathological changes. Non-neoplastic lesions were identified in 25 cases (27%), predominantly follicular cysts (15.6%) followed by luteal cysts (8.9%). Neoplastic lesions comprised 13 cases included serous cystadenoma (5.6%), mucinous cystadenoma (2.2%), teratoma (2.2%), and malignant tumors such as serous and mucinous cystadenocarcinomas (each 2.2%).**(Table-8)**

Table-7 Distribution of histopathological findings in ovary (N = 90)

S.N	Histopathological findings	Number of cases	Percentage (%)
1.	Follicular cyst	14	15.6%
2.	Luteal cyst	8	8.9%
3.	Endometeriosis	3	3.3%
4.	Serous cystadenoma	5	5.6%
5.	Serous carcinoma	2	2.2%
6.	Mucinous cystadenoma	2	2.2%
7.	Mucinous carcinoma	2	2.2%
8.	Teratoma	2	2.2%
9.	Unremarkable	52	57.8%
	Total	90	100%

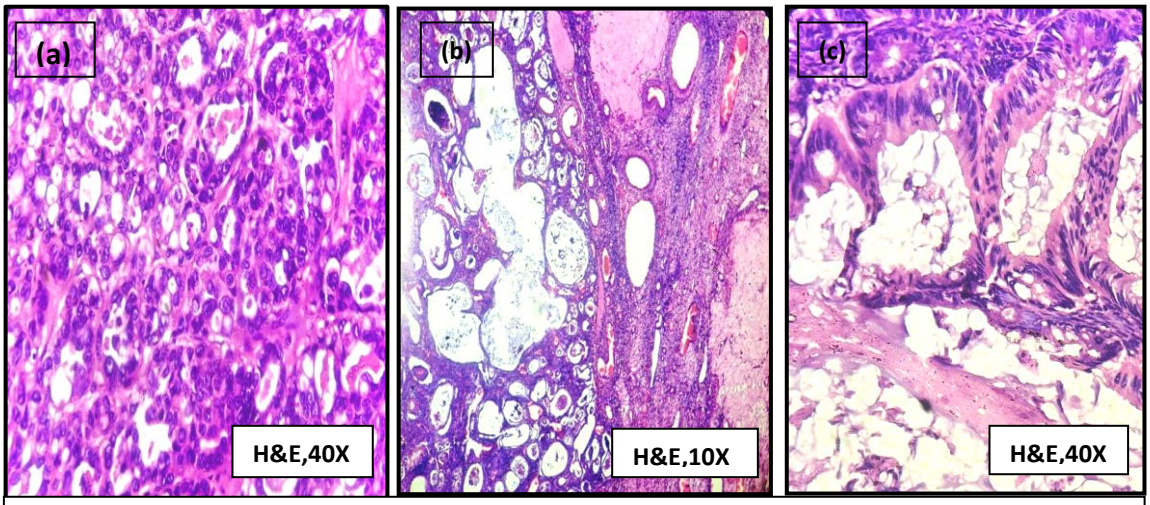

Fig. 11 (a) Ovary. Serous carcinoma -A higher magnification photomicrograph showing tumors cells arranged in glands and sheets, having large vesicular nuclei (b) Ovary. Mucinous carcinoma - Crowded glands and cyst with complex irregular infoldings and protrusions into the surrounding stroma. (c) Ovary. Mucinous carcinoma -A higher magnification photomicrograph showing gland lined by pseudostratified columnar epithelium with intracellular mucin.

Among 90 fallopian tube specimens, the majority (87.7%) exhibited normal histology. Nonneoplastic lesions included salpingitis (3.3%) and paratubal cysts (7.8%).One case (1.1%) of focal serous tubal intraepithelial lesion (STIL) is also found in present study.It is a rare pathological finding in the fallopian tubes, characterized by epithelial stratification, loss of polarity, mild nuclear atypia, and papillary architecture. **(Table-8)**

Table-8 Distribution of histopathological findings in fallopian tube (N = 90).

S.N	Histopathological findings	Number of cases	Percentage (%)
1.	Salpingitis	3	3.3%
2.	Paratubal cyst	7	7.8%
3.	Serous tubular intraepilthelial lesion (STIL)	1	1.1%
4.	Unremarkable	79	87.7%
	Total	90	100%

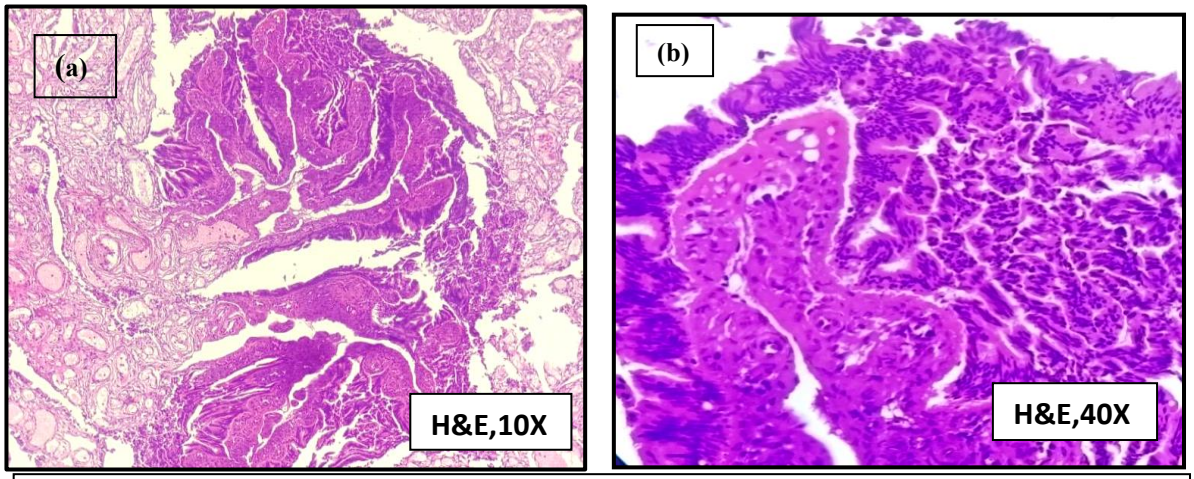

Fig.12 (a) Fallopian tube. Serous tubular intraepithelial lesion. (b) Fallopian tube. Serous tubular intraepithelial lesion -A higher magnification photomicrograph showing stratification of fallopian tube epithelium and loss of polarity.

Correlation between preoperative clinical diagnosis and histopathological findings showed high concordance rates: leiomyoma (97.2%), adenomyosis (91.4%), endometrial polyp (77.7%), suspected endometrial malignancy/hyperplasia (71.4%), uterovaginal prolapse (96.2%), and ovarian cystic lesions (100%).**(Table-9)**

Table.9: Correlation of pre-operative clinical diagnosis with histopathological diagnosis (N=155 cases)

S.N	Preoperative diagnosis	Number of cases	Histopathological diagnosis	
			Number of cases	Percentage (%)
1.	Leiomyoma	71	69	97.2%
2.	Adenomyosis	35	32	91.4%
3.	Endometerial polyp	9	7	77.7%
4.	Endometrial hyperplasia/malignancy	7	5	71.4
5.	Utero vaginal prolapse	20	19	95%
6.	Ovarian cyst /tumor	13	13	100%
	Total	155	145	

DISCUSSION

Hysterectomy remains a very common global gynecological surgery, offering symptom relief and definitive treatment for a various benign and malignant conditions affecting the uterus and adnexa. Despite advancements in conservative medical and minimally invasive surgical treatments for uterine pathologies, hysterectomy continues to be a preferred intervention for several refractory or severe cases gynecologic conditions. In India the reported incidence of hysterectomy is around 6–8%, with this rate gradually increasing, partly due to its role in preventing uterine malignancies and managing severe premenopausal bleeding and prolapse.[10,11]

The study aimed to evaluate the histomorphological spectrum of lesions identified in hysterectomy specimens and establish a correlation with clinical indications and patient age. We analyzed 155 cases over a one-year duration at Rama Medical College Hospital and Research Centre, Hapur, Uttar Pradesh.

Our study revealed that hysterectomies were most prevalent in the 41–50-year age group (45.2%) followed by the 31–40-year group (33.5%). This pattern aligns with previous studies by Ticku et al., Chaware et al., and Sujatha et al., who also reported peak incidences in the same age range .[12-14].

Abdominal hysterectomy was frequently performed than vaginal hysterectomy, a finding aligning with studies conducted by Ajmera et al. and Gupta et al. [15,16]. Uterine leiomyoma (AUB-L) constituted the most common clinical indication in our study, reported in 45.8% of cases, which corroborates with observations by Ajmera et al. and Archana et al. [15,17]

Histologically, the most frequently observed endometrial pattern was proliferative endometrium (38.7%), in accordance with study by Ticku et al. (38.4%) and Kaur et al. (31%). [12,18]Atrophic endometrium was the second most common pattern (23.8%), similar to results reported by Gangadharan et al. (24.5%).[19]. Secretory endometrium was noted in 13.5% of cases, in concordance with Kaur et al. (13%).[18]Chronic endometritis was an incidental finding, found in only 0.7% of cases, aligning with Ticku et al..[12].

Endometrial adenocarcinoma was detected in 1.3% of cases, predominantly in the 51–60 years age group, which corresponds with the findings of Pervez et al.[20](1.87%)

One case of each low-grade endometrial stromal nodule and low grade endometrial stromal sarcoma were also diagnosed.

Leiomyoma was the most predominant myometrial lesion, identified in 44.5% of cases, aligning with the studies by Tiwana et al., Maheshwari et al., and Gangadharan et al., who found similar frequencies 43.7%, 42.3%, and 41%, respectively . [19,21,22]

Intramural leiomyomas were the predominant subtype (59.4%), corroborates with the studies by Jung et al. (55.7%).[23] Gowri et al. (48%) and Rosario et al. (52%) [24].

Degenerative changes were identified in 20% of leiomyomas, with hyalinization (13.6%) being the most common, comparable to the findings of Gowri et al (16.9%).[24]

Rare variants of leiomyomas, including cellular, lipoleiomyoma, epithelioid, and vascular types, were found in 2.6% of cases, corresponds with the 4.55% incidence reported by Manjula et al. [25].

Leiomyoma and adenomyosis exhibited the highest diagnostic frequency within the 41–50-year age group (55% and 53.9%, respectively), paralleling the observations by Ticku et al.(49.64% and 46.58%).[12]

Chronic cervicitis was identified as the predominant cervical pathology (51%), consistent with findings by Mallappa et al., who reported an incidence of 55.8%.[26]

In ovarian lesions, non-neoplastic cysts, particularly follicular cysts (15.6%), were most prevalent, followed by luteal cysts (8.9%) and endometriosis (3.3%). These findings corroborates prior observtion by Nausheen et al., Pandey et al., and Perveen et al.[27-29]. Among neoplastic lesions, serous cystadenoma was the most frequent benign tumor. Malignant tumors included serous and mucinous cystadenocarcinomas (each 2.2%).

The most frequently encountered benign lesion in the fallopian tubes was chronic salpingitis (3.3%), consistent with Imam Z.S. et al., who reported 8.6%.[24]It is currently accepted that serous tubular intraepithelial lesion or carcinoma (STIL or STIC) is a precursor lesion to ovarian HGSCs. [30-32]

In our study majority of the preoperative clinical diagnoses were corresponds with the histopathological reports, with a proportion ranging from 70% to 100%. Jaleel et al. [33]. There were a high concordance, especially for leiomyoma (97.2%) and adenomyosis (91.4%), indicating the reliability of clinical evaluation in preoperative diagnosis. However, discrepancies were noted in endometrial hyperplasia/malignancy (71.4%) and endometrial polyps (77.7%). underscoring the importance of histopathological confirmation for accurate diagnosis and management.

CONCLUSION

This study highlights the critical importance of correlating histopathological findings with clinical indications and patient age in hysterectomy cases. While the majority of cases demonstrated strong concordance between preoperative clinical diagnoses and final histopathological outcomes, several instances revealed coexisting or incidental pathologies—including precancerous and occult malignant lesions—that were clinically or radiologically undetected.

Consequently, these Observations emphasize the critical and indispensable role of routine histopathological examination in all hysterectomy specimens, regardless of their gross appearance. Such examination enables accurate diagnosis, informs postoperative management, and ensures that clinically silent but significant pathologies are not overlooked.

Therefore, hysterectomy remains a pivotal therapeutic intervention in gynecological practice. Histopathological evaluation of each specimen should be considered mandatory to achieve optimal patient outcomes, guide treatment decisions, and enhance long-term prognosis.

REFERENCES:

1. Qamar-ur-Nisa. Hysterectomies, an audit at a tertiary care hospital. Professional Med J. 2011;18(1):45-50.
2. Kjerulff KH, Erickson BA, Langenberg PW. Chronic gynecological conditions reported by US women: findings from the National Health Interview Survey, 1984 to 1992. Am J Public Health. 1996;86(2):195-9.
3. Patil HA, Patil A, Mahajan SV. Histopathological findings in uterus and cervix of hysterectomy specimens. MVP J Med Sci. 2015;2(1):26-9.
4. John, A., Rock, M. D., Jhon, D., & Thompson, M.D. (2003). Telind's Operative Gynaecology. 1st edition Lipincott – Ravenplace
5. Fraser Ian S, Hilary OD, Broder M Munro MG. The FIGO recommendations on terminologies and definitions for normal and abnormal uterine bleeding. Sem Reprod Med. 2011;29(5):383-90.
6. Kalambe M, Jungari M, Chaudhary A, Kalambe A, Shrivastava D. PALM COEIN FIGO Classification System for Causes of Abnormal Uterine Bleeding (AUB) in Non-Gravid Women of Reproductive Age group in a Peri Urban Tertiary Care Hospital. Int J Curr Res Rev. 2020;12(15):128-33.
7. National Health portal of India, Abnormal uterine bleeding. 2017
8. Pandey A, Anil M, Pandey S. Histo-pathological patterns in hysterectomy specimens at a tertiary care centre in India. Bioinformation. 2023;19(4):460.
9. Dalal A. DC Dutta's textbook of Gynaecology and textbook of obstetrics. Journal of Obstetrics and Gynaecology of India. 2016 Aug;66(4):303:185-195National Health portal of India, Abnormal uterine bleeding. 2017.
10. Singh A, Arora AK. Why hysterectomy rate are lower in India. Indian journal of community medicine. 2008 Jul 1;33(3):196-7.
11. Olsson JH, Ellström M, Hahlin M. A randomised prospective trial comparing laparoscopic and abdominal hysterectomy. BJOG: An International Journal of Obstetrics & Gynaecology. 1996 Apr;103(4):345-50.
12. Dr.Singh P, Dr Ticku A and Dr Jamwal G.Histopathological spectrum of hysterectomy specimens in tertiary care hospital: a prospective study. European Journal of Biomedical and Pharmaceutical sciences,2017,Volume4, Issue8,858-866.
13. Chaware SA, Ramteke RA, Abhang R. A histopathological study of hysterectomy specimens of menorrhagia patients. MedPulse Int J Pathol. 2020;15(1):1-4.
14. Sujatha R, Jaishree T, Manjunatha YA. Histomorphological analysis of uterine and cervical lesions in hysterectomy specimens. IP J Diagnostic Pathol Oncol. 2019;4(1):72-
15. Ajmera SK, Mettler L, Jonat W. Operative spectrum of hys-terectomy in a German university hospital. *J Obstet Gynecol India* 2006;56(1):69-63
16. Ankur Gupta, Sangita Sehgal, Ajay yadav, Vinod Kumar. Histopathological Spectrum of Uterus and Cervix in Hysterectomy Specimens. *Int J Med Res Prof* 2016;2(3):136-139.
17. Archana B, Michelle F. Evaluation and histopathological correlation of abnormal uterine bleeding in perimenopausal women. Bombay Hospital J. 2010;52(1):69-72
18. Kaur S J, Gupta RK, Kaur M. Clinicopathological Study of Uterine Lesions in Hysterectomy Specimens. Ann. Int. Med. Den. Res. 2018; 4(1): PT18-PT22
19. Gangadharan V & Prasanthi C. Hysterectomy a Clinico-pathological correlation in a rural setting. Indian Journal of Basic and Applied Medical Research. 2016. 5(2), 8-15.
20. Pervez SN, Khaliq S, Ali H, Shah SA. Histopathological analysis of endometrial lesions and its correlation with age in Khyber Pakhtunkhwa region of Pakistan. Rawal Medical Journal. 2023 Mar 3;48(1):164.
21. Tiwana K K, Nibhoria S, Monga T, Phutela R. Histopathological audit of 373 non oncological hysterectomies in a teaching hospital. Pathology research international. 2014;1-5.
22. Dr.J. Maheswari "Histopathological Spectrum of Lesions in Hysterectomy Specimens At A Tertiary Care Hospital– One Year Study." IOSR Journal of Dental and Medical Sciences (IOSRJDMS),vol.16,no.10,2017,pp.34–38
23. Jung JK, Koi MS, Jung BW, Lee HH, Choi HJ, Shin SK. A clinical analysis of uterine myoma. Korean J Obstet Gynecol. 1998;41(1):210-9
24. Gowri M, Mala G, Murthy S, Nayak V. Clinicopathological study of uterine leiomyomas in hysterectomy specimens. Journal of Evolution of Medical and Dental Sciences. 2013;2(46):9002-9.
25. Manjula K, Rao KS, Chandrasekhar HR. Variants of Leiomyoma: histomorphological study of tumors of myometrium. Journal of South Asian Federation of Obstetrics and Gynecology. 2011;3(2):89-92
26. Imam ZS, Chandra K, Monalisa BK, Sinha A, Singh A, Singh SK. Histopathological spectrum of hysterectomy specimens-A retrospective analysis at IGIMS, Patna, Bihar. 2018 Jul 23;41:50.
27. Nausheen F, Iqbal J, Bhatti FA, Khan AT, Sheikh S: Hysterectomy: the patient's perspective. Ann King Edw Med Univ. 2004, 10:339-41. 10.21649/akemu.v10i4.1220.
28. Pandey D, Sehgal K, Saxena A, Hebbar S, Nambiar J, Bhat RG: An audit of indications, complications,andjustification of hysterectomies at a teaching hospital in India. Int J Reprod Med. 2014, 2014:279273. 10.1155/2014/279273.
29. Perveen S, Tayyab S: A clinicopathological review of elective abdominal hysterectomy . J Surg Pak. 2008, 13:26-9.
30. Tang S, Onuma K, Deb P, Wang E, Lytwyn A, Sur M, *et al*. Frequency of serous tubal intraepithelial carcinoma in various gynecologic malignancies: A study of 300 consecutive cases. Int J Gynecol Pathol 2012;31:103-10.
31. Patrono MG, Iniesta MD, Malpica A, Lu KH, Fernandez RO, Salvo G, *et al*. Clinical outcomes in patients with isolated serous tubal intraepithelial carcinoma (STIC): A comprehensive review. Gynecol Oncol 2015;139:568-72.
32. Zakhour M, Danovitch Y, Lester J, Rimel BJ, Walsh CS, Li AJ, *et al*. Occult and subsequent cancer incidence following risk-reducing surgery in BRCA mutation carriers. Gynecol Oncol 2016;143:231-5.
33. Jaleel R, Khan A, Soomro N: Clinicopathological study of abdominal hysterectomies . Pak J Med Sci. 2009,1. 25:630-4.