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Audit of hysterectomies: Clinical indications and histopathological analysis of hysterectomy specimens in a tertiary care hospital in north India

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Abstract

Introduction: Hysterectomy is the most common major surgical procedure performed in gynecology and remains an effective treatment option for various gynecological disorders. However, with its increasing frequency, the procedure may sometimes be misused, underused, or overused. Regular audits are essential to formulate appropriate recommendations and avoid unnecessary surgeries. This study aimed to audit hysterectomy specimens to assess the clinical indications and correlate them with histopathological findings in a tertiary care teaching hospital.

Methods: This prospective observational study was conducted over 16 months (March 2024–June 2025) in the Department of Pathology, Government Medical College, Baramulla. All patients who underwent hysterectomy during this period were included. Clinical indications were correlated with histopathological findings of the respective specimens.

Results: A total of 119 hysterectomies were performed. Of these, 79 (66.4%) were from the reproductive age group (≤45 years) and 40 (33.6%) from the postmenopausal group (>45 years). The most common clinical indication in the reproductive group was abnormal uterine bleeding (AUB), followed by fibroids and adenomyosis, while in postmenopausal women, vaginal prolapse and postmenopausal bleeding were predominant. Leiomyoma was the most frequent histopathological finding, followed by adenomyosis. Endometrial stromal sarcoma was identified in four cases (3.4%), all in the reproductive age group. In 11 cases (9.2%), no significant pathology was noted.

Conclusion: Hysterectomy should be performed only after thorough evaluation of indications. Periodic audits of hysterectomy specimens are crucial to ensure rational utilization of this procedure and to improve the quality of gynecological healthcare.

Keywords: hysterectomy; audit; histopathology; leiomyoma; adenomyosis

Introduction

Hysterectomy is one of the most commonly performed surgical procedures in gynecology worldwide [1–5]. It is a definitive treatment for various benign and malignant conditions affecting the female genital tract. The prevalence of hysterectomy in India is reported to be approximately 17 per 1,000 married women, with regional variations ranging from 2 to 63 per 1,000 across different states [6]. The procedure is indicated for several gynecological pathologies, including uterine fibroids, abnormal uterine bleeding (AUB), adenomyosis, uterovaginal prolapse, endometriosis, and malignancies of the reproductive tract [1]. In certain pathological conditions, hysterectomy remains the only curative option; however, not all cases present with absolute indications for surgery [7].

Over the years, hysterectomy has become a commonly opted treatment modality, particularly among women with menstrual dysfunctions, many of whom elect for the procedure to achieve symptomatic relief [8]. With

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the increasing frequency of hysterectomies in recent decades [9], there is a growing need for systematic audits to ensure rational decision-making and appropriate utilization of the procedure. Regular audits help evaluate clinical indications, assess histopathological outcomes, and identify discrepancies between preoperative diagnosis and final histological findings. Such evaluations assist in formulating recommendations to avoid unnecessary hysterectomies.

Hysterectomy, though effective, has a significant impact on a woman's life—surgically, anatomically, hormonally, and psychologically. While immediate surgical complications may include hemorrhage, infection, and injury to adjacent organs, long-term effects can involve urinary incontinence, sexual dysfunction, pelvic organ prolapse, and an increased risk of osteoporosis [10–12]. Therefore, understanding the appropriateness of indications and correlating them with histopathological findings is crucial for improving patient outcomes and ensuring evidence-based clinical practice.

Studies from developed countries such as the United States, Australia, and European nations have consistently reported hysterectomy as the most frequently performed gynecological surgery [2,4,13]. In India as well, institutional and hospital-based audits—particularly in teaching hospitals—have demonstrated a similar increasing trend [9]. It is imperative for practitioners performing hysterectomies to be well-versed with the potential risks, complications, and long-term consequences, and to counsel patients accordingly.

Surgical intervention for hysterectomy may be pursued via an abdominal, vaginal, or laparoscopic route. The final determination of the approach is based on a multifactorial assessment, which includes the operative indication, uterine volume, the nature of the pathology, and the surgeon's experience. Notably, the abdominal approach continues to be widely utilized, offering a versatile route that is appropriate for managing both benign and malignant disease [7].

The present study was aimed to evaluate the clinicopathological correlation in hysterectomy cases at our teaching hospital by auditing the histopathology specimens and correlating the preoperative clinical indications. This analysis serves to assess the appropriateness of surgical intervention and identify common pathological diagnoses.

Materials and methods

The present study included all hysterectomy specimens received by the Department of Pathology at Government Medical College Baramulla for histopathological examination over a period of 16 months (March 2024–June 2025), encompassing both benign and malignant conditions. This was a prospective observational study in which histopathological findings were compared with the clinical indications for surgery. Patient details, including age, clinical indication, and radiological findings, were collected from surgical pathology requisition form completed by the operating surgeons.

Ethical approval for the study was obtained from the Institutional Review Board and Ethics Committee. Specimens included total abdominal hysterectomy (TAH), TAH with unilateral salpingo-oophorectomy, TAH with bilateral salpingo-oophorectomy, and vaginal hysterectomy. All specimens were fixed in 10% neutral buffered formalin for 24 hours. Gross examination was performed, and representative sections were taken from all pathological areas. Routine H&E (Hematoxylin and Eosin) staining was performed, and slides were examined under light microscopy. A hysterectomy was considered justified if histopathological findings either correlated with the clinical indication or revealed other significant pathologies.

Statistical analysis

Data was analyzed using SPSS version 25.0. Descriptive statistics were used to summarize patient demographics, clinical indications, and histopathological findings. Continuous variables were expressed as mean ± standard deviation, and categorical variables as frequencies and percentages. The chi-square test was used to assess the statistical significance of differences between the reproductive (≤45 years) and postmenopausal (>45 years) age groups. A p-value <0.05 was considered statistically significant.

Results

A total of 119 hysterectomies were performed over the 16-month study period, which were divided into two groups: reproductive age group (<45 years, n=79; 66%) and postmenopausal age group (≥45 years, n=40; 34%). In the reproductive age group, the most common clinical indication for hysterectomy was abnormal uterine bleeding (AUB), followed by fibroids and adenomyosis.

Histopathological examination of the endometrium revealed that 24 cases (30.4%) showed only stratum basale without stratum functionale, 12 cases (15.2%) showed proliferative endometrium, and 28 cases (35.4%) showed secretory changes. Other findings included benign endometrial polyps in 5 cases (6.3%), endometrial stromal sarcoma in 4 cases (5.1%), endometrial hyperplasia without atypia in 2 cases

(2.5%), and disordered proliferative endometrium in 3 cases (3.8%) (Table 1).

The most frequent myometrial pathology was leiomyoma, observed in 38 cases (48.1%), of which 14 cases (36.8%) were multiple, including submucosal, intramural, and subserosal locations. Degenerative changes in leiomyoma included hyaline degeneration in 10 cases (26.3%), myxoid change in 6 cases (15.8%), adenomyotic foci in 3 cases (7.9%), and lipomatous degeneration in 2 cases (5.3%). Adenomyosis was present in 22 cases (27.8%), with diffuse involvement in 5 cases (22.7%) (Table 2).

Table 1: Histopathological Endometrial findings.

Variables	*Reproductive age group (≤45) (N=79)*	*Postmenopausal age group (>45) (N=40)*	*Total (n=119)*
Basal endometrium	24 (30.4%)	15 (37.5%)	39 (32.8%)
Secretory changes	28 (35.4%)	4 (10%)	32 (26.9%)
Proliferative	12 (15.2%)	2 (5%)	14 (11.8%)
Disordered proliferative endometrium	3 (3.8%)	2 (5%)	5 (4.2%)
Hyperplasia without atypia	2 (2.5%)	2 (5%)	4 (3.4%)
Atrophic	-	15 (37.5%)	15 (12.6%)
Polyps	5 (6.3%)	2 (5%)	7 (5.9%)
Endometrial stromal sarcoma	4 (5.1%)	-	4 (3.4%)

Table 2: Histopathological myometrial findings.

Variables	*Reproductive age group (≤45) (N=79)*	*Postmenopausal age group (>45) (N=40)*	*Total (n=119)*
Leiomyoma	38 (48.1%)	11 (27.5%)	49 (41.2%)
Hyaline	10 (12.7%)	3 (7.5%)	13 (10.9%)
Myxoid	6 (7.6%)	2 (5%)	8 (6.7%)
Adenomyosis	3 (3.8%)	2 (5%)	5 (4.2%)
Lipomatous	2 (2.5%)	1 (2.5%)	3 (2.5%)
Adenomyosis	22 (27.8%)	5 (12.5%)	27 (22.7%)
Diffuse	5 (12.5%)	5 (12.5%)	10 (8.4%)
Dystrophic calcification of vessels (myometrium)	-	5 (12.5%)	5 (4.2%)

Cervical examination predominantly revealed chronic nonspecific cervicitis, with occasional Nabothian cysts, tunnel clusters, or focal squamous metaplasia, and one case of benign endocervical polyp; none of the hysterectomies were performed primarily for cervical pathology. In 11 cases (13.9%), no significant pathology was identified.

In the postmenopausal group, the most common clinical indication for hysterectomy was vaginal prolapse (22 cases, 55%), followed by postmenopausal bleeding (16 cases, 40%). Endometrial examination revealed basal endometrium in 15 cases (37.5%) and atrophic changes in 15 cases (37.5%), while secretory changes were present in 4 cases (10%), proliferative endometrium in 2 cases (5%), benign polyps in 2 cases (5%), endometrial stromal sarcoma in 4 cases (5.1%), endometrial hyperplasia without atypia in 2 cases (2.5%), and disordered proliferative endometrium in 2 cases (5%) (Table 1).

Myometrial findings included leiomyomas in 11 cases (27.5%), with associated hyaline degeneration in 3 cases (7.5%), myxoid change in 2 cases (5%), adenomyotic foci in 2 cases (5%), and fatty degeneration in 1 case (2.5%). Diffuse adenomyosis was noted in 5 cases (12.5%), and 5 cases (12.5%) showed senile changes with thick hyalinized and calcified myometrial vessels (Table 2). Grossly elongated and hypertrophied cervices in prolapse specimens predominantly showed chronic nonspecific cervicitis.

The combined analysis of endometrial and myometrial histopathology revealed distinct patterns between the

two age groups. Secretory changes were significantly more common in reproductive women (35.4% vs. 10%; p=0.006), while atrophic and basal endometrium predominated among postmenopausal women (each 37.5%). Leiomyoma was the most frequent myometrial pathology in both groups (48.1% vs. 27.5%), although more prevalent in the reproductive group. Other findings, including proliferative endometrium, adenomyosis, and dystrophic calcification, did not differ significantly between the two age groups, highlighting age-related variations in uterine histopathology associated with hormonal influences and reproductive aging. Also, no statistically significant evidence was fond to conclude that the proportion of hyperplasia without atypia is different between the reproductive age group and the postmenopausal age group (p=0.481).

Discussion

A total of 119 hysterectomy specimens were received during the study period. Of these, 79 (66%) were abdominal hysterectomies (TAH), 22 (18.5%) were vaginal hysterectomies (VH), and 18 (15%) were laparoscopic hysterectomies. Most hysterectomies were performed in reproductive-aged women. Similar findings were reported by Pandey et al., who observed that 75.5% of hysterectomy specimens were TAH and 17.8% were VH [9]. Abdominal hysterectomy has also been reported as the most common procedure by Toma et al., who documented 78% TAH and only 14% VH [14]. Mukhopadhyay et al. similarly reported TAH as the predominant approach compared to VH [15], and Leung et al. documented 70.2% TAH and 15.9% VH [16].

Nationwide inpatient hysterectomy surveillance in the United States reported that the most common indications for hysterectomy were symptomatic uterine leiomyomas (51.4%), abnormal uterine bleeding (41.7%), endometriosis (30%), and prolapse (18.2%) [17,18]. In our study, the most common indication for abdominal TAH was leiomyomas (38 cases), followed by adenomyosis (22 cases). Vaginal hysterectomies were mostly performed for uterovaginal prolapse (18 cases) and postmenopausal bleeding (4 cases).

Both national and international studies have reported similar trends, with fibroids as the leading indication for TAH and prolapse for VH. For instance, Pandey et al. [9] reported fibroids as the main indication for TAH and prolapse for VH. Leung et al. [16] reported fibroids in 73.7% of TAH cases and prolapse in 96.2% of VH cases. Broder et al. [19] in the USA found fibroids (60%) and prolapse (11%) as the most common indications, and a study from Pakistan by Qamar et al. [20] reported fibroids (33%), prolapse (19%), and abnormal uterine bleeding (12%) as common indications.

Among the 119 hysterectomies in our study, 108 (90.8%) showed pathologies on microscopic examination, while 11 cases (9.2%) revealed no significant pathology. Notably, all 11 cases without significant pathology were from reproductive-age women, indicating that some of these could potentially have been managed with nonsurgical or minimally invasive treatment options.

Hysterectomy is frequently used as a first-line treatment in cases such as postmenopausal bleeding, postpartum hemorrhage, and abnormal uterine bleeding that are refractory to conservative management. However, endometrial ablation or other conservative strategies can achieve favorable outcomes in many gynaecological conditions without necessitating hysterectomy. As noted, hysterectomy may be misused, underused, or overused at different times [21, 22]. While it remains a common procedure to improve quality of life and treat life-threatening conditions, careful evaluation of clinical indications, thorough discussion of all radiological findings, and consideration of alternative therapies are essential before proceeding with surgical removal of the uterus.

Limitations: This study was conducted at a single tertiary care teaching hospital, limiting generalizability to the wider population. The sample size was relatively small, and follow-up data on long-term outcomes or postoperative complications were not available. Additionally, detailed patient preferences and conservative management attempts prior to hysterectomy were not systematically recorded.

Conclusion

Hysterectomy, like any major surgical procedure, carries potential risks and complications. Therefore, clinical indications should be carefully evaluated, and efforts should be made to preserve the uterus in cases of benign pathologies, particularly abnormal uterine bleeding. Minimally invasive and conservative treatment options should be offered whenever feasible, and patients should be thoroughly counselled before deciding on surgery. Mandatory reporting of all hysterectomies and systematic audits can help improve the quality of healthcare services and may contribute to reducing unnecessary hysterectomies.

Conflicts of interest

Authors declare no conflicts of interest.

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