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Histopathological analysis of gynaecological hysterectomy specimens at a tertiary care hospital in southern Nigeria

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Abstract
Background: Hysterectomy is the most common major gynaecological surgery in the world. It effectively treats many gynaecological conditions. Several studies have described the pathological findings in hysterectomy specimens and investigated the relationship between preoperative clinical diagnosis and pathological diagnosis, but none have been carried out at the study centre.
Objectives: To determine the indications for hysterectomy, identify the patterns of pathologies in hysterectomy specimens and their correlation with pre-operative clinical diagnosis at the University of Port Harcourt Teaching Hospital.
Material and Methods: This retrospective study included 202 women who had non-oncological hysterectomy at the Gynaecology unit of the University of Port Harcourt Teaching Hospital between January 1, 2011, and December 31, 2016. The study included all types of hysterectomies, such as vaginal and total abdominal hysterectomies, as well as unilateral/bilateral salpingectomy/salpingo-oophorectomy. Hysterectomy for gynaecological cancer and pregnancy complications were not considered. The information was gathered from the patients' theatre records, histopathology reports, and case notes and entered into a predesigned proforma. The data set included socio-demographic characteristics, clinical presentation, type of hysterectomy, clinical diagnosis, and pathological lesions. The statistical analysis was performed using SPSS version 25, with a p-value of 0.05 set as the level of significance.
Results: Of The 202 cases studied, the most common age group that underwent hysterectomy was 35 and 44 years 94 (46.5%). The most common type of hysterectomy was total abdominal hysterectomy 165 (84.6%). The commonest clinical indications for hysterectomy were leiomyoma 135 (66.8%), followed by adenomyosis 17 (8.4%). The most common findings identified by histopathology were proliferative endometrium 78 (38.6%) in endometrium, leiomyoma 135 (66.8%), in myometrium, chronic cervicitis 7 (3.5%) in cervix, and follicular cysts 15 (40.6%) in ovaries. Histopathological confirmation of pre-operative diagnosis was 88.6% for cervical pathology. Majority of the cases pre-operatively diagnosed as Dysfunctional uterine bleeding (DUB) were found to have adenomyosis, endometrial polyp, secretory endometrium, or disordered proliferative endometrium.
Conclusion: The most common pathologies found were proliferative endometrium in endometrium, leiomyoma in myometrium, chronic cervicitis in cervix, and chronic salpingitis in fallopian tubes. In most cases, histopathologic analysis confirmed the clinical diagnosis.

Keywords: Hysterectomy, indications, histopathology, pattern, Port Harcourt, Nigeria

1. Introduction
The uterus is a vital reproductive and hormone-responsive organ that can develop a variety of non-neoplastic and neoplastic conditions [1]. The uterus is made up of the uterine corpus and the cervix, with the uterine corpus consisting of the myometrium and endometrium. The uterine corpus is hormonally influenced and loses its endometrial mucosa once a month [2]. Many patients visit gynaecologists for uterine and cervical pathologies.
Though several treatment options are available for various uterine pathologies, hysterectomy remains the most preferred. Despite the availability of other medical and conservative surgical procedures, hysterectomy remains the most commonly used definitive treatment [3-5].
Women aged 30-54 years have the highest rate of hysterectomy compared to other age groups, accounting for 74% of all hysterectomies performed [6]. Historically, the uterus was removed either through the abdominal or vaginal route, with or without salpingo-oophorectomy on one or both sides [7].

Common medical indications for hysterectomy include fibroids, heavy menstrual bleeding, chronic pelvic pain, pelvic inflammatory disease, uterine prolapse, and reproductive organ cancer. Although histopathology correlates well with clinico-radiological diagnosis, a variety of lesions have been discovered solely through microscopy. Adenomyosis is still the most frequently missed preoperative diagnosis and the most common histopathological diagnosis. Grossly unremarkable specimens may reveal pathologies upon histological examination. Similarly, many non-neoplastic lesions may exhibit malignant foci under microscopy [5]. Histopathological examination of surgical specimens has ethical, legal, diagnostic, and therapeutic implications. Hence, all hysterectomy specimens must undergo proper histopathological examination. The purpose of this study was to correlate various indications for hysterectomy with histopathological findings in specimens, thereby determining the proportion of pre-operative clinical diagnoses confirmed on histopathological examination. We also attempted to determine the frequency of disease conditions, emphasizing the importance of histopathological examination of specimens in clinical settings. Failure to do so may result in suboptimal care or treatment, as well as overtreatment of specific disease conditions, particularly malignant conditions.

2. Materials and Methods

2.1 Study Area: This study was conducted at the gynaecology unit of the University of Port Harcourt Teaching Hospital (UPTH). The University of Port Harcourt Teaching Hospital is a 988-bed hospital in Alakahia, in Obio-Akpor Local Government Area of Rivers state. It is a tertiary hospital that serves as a referral centre for all levels of healthcare in Rivers state and other neighbouring states including Bayelsa, Imo and Abia. Every week, the gynaecology clinic is open from Monday to Friday, and each clinic session is led by a team of consultants. Patients are evaluated in the clinic before they are admitted into the gynaecological ward for surgery.

2.2 Methods: This was a retrospective study conducted at the Gynaecology unit of the University of Port Harcourt Teaching Hospital. The clinical and histopathological reports of 202 patients who underwent non-oncological hysterectomies between January 1, 2011, and December 31, 2016, were obtained from their case notes and histopathology reports. The study included all hysterectomy specimens with uterine and cervical indications for hysterectomy, regardless of the surgical route or type. Hysterectomies without adequate clinical data, as well as those performed for gynaecological malignancies and pregnancy-related complications, were excluded. Clinical data collected included socio-demographic characteristics, clinical presentation, clinical diagnosis, and type of hysterectomy, while histopathologic data included gross and microscopic findings on the specimens. The specimen was examined histologically by two pathologists.

2.3 Statistical Analysis: The data was analyzed with the Statistical Package for Social Sciences version 25. The frequency of all histopathologic diagnoses was reviewed, and clinicopathologic correlation was performed for uterine and cervix lesions. For categorical variables, frequency and percentages were computed. The descriptive statistics were summarized using frequency tables.

2.4 Ethical Consideration: The study was approved by the research and ethics committee of the University of Port Harcourt Teaching Hospital.

3. Results

This study included data from two hundred and two women. Table 1 displays the demographic characteristics of women. Approximately half of them 94 (46.5%) were between the ages of 35 and 44, with 68 (33.3%) between the ages of 25 to 34. Many of the women 128 (63.4%) were married. Most of the women 156 (77.2%) were Para 3-4, and two-thirds 145 (71.8%) had never used hormonal contraception. Almost all 178 (88.1%) of them had never had a Pap smear screening. This is shown in Table 2. According to Table 3, the most common type of hysterectomy was total abdominal hysterectomy 165 (84.6%), followed by total abdominal hysterectomy with bilateral salpingo-oophorectomy 25 (19.2%). Many of the women were not hypertensive 184 (91.1%) or diabetic 196 (97.0%). All of the women had no family history of cancer. Leiomyomas were the most common clinical indication for hysterectomy, accounting for 135 (66.8%), followed by adenomyosis 17 (8.4%), with the least being endometrial cancer 2 (1%). This is shown in Table 4. The most common findings on histopathological examination of endometrium were proliferative 78 (38.6%) and secretory endometrium 67 (33.1%), with endometrial carcinoma accounting for 2 (1%). This is illustrated in Table 5. Histopathology diagnosis of the myometrium revealed leiomyoma in 135 cases (66.8%), adenomyosis in 13 cases (6.4%), and leiomyoma with adenomyosis in 10 cases as displayed in Table 6. Table 7 shows that chronic cervicitis 7 (3.5%) is the most common cervical lesion, followed by CIN 6 (3%) and endocervical polyp 5 (2.5%). Follicular cysts were the most common ovarian pathology found in 15 (40.6%) cases, followed by luteal cysts in 13 (35.1%). This is illustrated in Table 8. Both histopathological analysis and clinical diagnosis agreed on 88.6% of patients with cervical pathology, which is 26% between random and perfect agreement. The level of agreement indicates that we can reject the hypothesis that histopathological analysis and clinical diagnosis are made at random, as shown in Table 9. However, Table 10 shows that neither histopathological analysis nor ultrasound scan diagnosis agreed significantly on the women's clinical diagnosis. The disagreement suggests that we cannot reject the hypothesis that histopathological and clinical diagnoses are made at random.

Table 1: Demographic Characteristics of the women (N=202)

Attributes	N (%)
Age (Years)	
≤24	5 (2.5)
25-34	68 (33.7)
35-44	94 (46.5)
45-54	24 (11.9)
55-64	5 (2.5)
≥65	6 (3.0)
Marital Status	
Divorced	2 (1.0)
Married	128 (63.4)
Single	69 (34.2)
Widowed	3 (1.5)
Education	
Primary	20 (9.9)
Secondary	39 (19.3)
Tertiary	143 (70.8)
Occupation	
Active	176 (87.1)
Inactive	23 (11.4)
Retired	3 (1.5)

Table 2: Reproductive Characteristics of the women (N=202)

Attributes	N (%)
Parity	
1-2	21 (10.4)
3-4	156 (77.2)
≥5	25 (12.4)
Age at Menarche (Years)	
≤10	4 (2.6)
11-20	198 (97.4)
Hormonal Contraceptive	
No	145 (71.8)
Yes	57 (28.2)
Pap Smear Screening	
No	178 (88.1)
Yes	24 (11.9)

Table 3: Clinical Characteristics of the women (N=202)

Attributes	N (%)
Type of Hysterectomy	
TAH	165 (84.6)
TAH + BSO	25 (9.2)
Vaginal Hysterectomy	12 (6.2)
Hypertension	
No	184 (91.1)
Yes	18 (8.9)
Diabetes Mellitus	
No	196 (97.0)
Yes	6 (3.0)
Alcohol Use	
No	170 (84.2)
Yes	32 (15.8)
Family History of Cancer	
No	202 (100)

*TAH: Total Abdominal Hysterectomy *BSO: Bilateral Salpingo-Oophorectomy

Table 4: Clinical Indications for Hysterectomy

Attributes	n (%)
Leiomyoma	135 (66.8)
Adenomyosis	17 (8.4)
DUB*	14 (6.9)
Uterovaginal prolapse	12 (6.0)
CIN*	7 (3.5)
Chronic cervicitis	6 (3.0)
Endometrial hyperplasia	5 (2.5)
Endometrial polyp	4 (1.9)
Endometrial carcinoma	2 (1.0)
Total	202 (100)

*DUB: Dysfunctional uterine bleeding *CIN: Cervical intraepithelial neoplasia

Table 5: Histopathological findings of the endometrium

Histopathological diagnosis	N (%)
Proliferative endometrium	78 (38.6)
Secretory endometrium	67 (33.1)
Disordered proliferative endometrium	26 (12.9)
Atrophic endometrium	15 (7.4)
Endometrial hyperplasia	7 (3.5)
Endometrial polyp	4 (2.0)
Endometritis	3 (1.5)
Endometrial carcinoma	2 (1.0)

Table 6: Histopathological findings of the myometrium

Histopathological diagnosis	N (%)
Leiomyoma	135 (66.8)
Adenomyosis	13 (6.4)
Leiomyoma + Adenomyosis	10 (5.0)
Myometrial hypertrophy	7 (3.5)
Normal histology	37 (18.3)

Table 7: Histopathological findings of the cervix

Histopathological diagnosis	N (%)
Chronic cervicitis	7 (3.5)
CIN*	6 (3.0)
Endocervical polyp	5 (2.5)
Endocervical polyp with cervicitis	3 (1.5)
Normal histology	181 (89.5)

*CIN: Cervical intraepithelial neoplasia

Table 8: Histopathological findings of the ovary

Histopathological diagnosis	N (%)
Follicular cyst	15 (40.6)
Luteal cyst	13 (35.1)
Simple serous cyst	6 (16.2)
Normal histology	3 (8.1)

Table 9: Statistical Correlation between clinical and histopathological diagnosis

Clinical Diagnosis					
Histopathology Analysis	**Agreement (%)**	**Expected Agreement (%)**	**Kappa**	**Z**	**P-Value**
Endometrium	0.99	1.46	-0.005	-1.79	0.96
Myometrium	3.47	3.43	0.0004	0.21	0.42
Cervix	88.6	84.7	0.26	7.85	<0.001*
Ovary	0.99	1.46	-0.005	-1.79	0.96
Fallopian tube	1.00	1.00	0.00	0.00	0.50

Table 10: Statistical Correlation between ultrasound scan and histopathological diagnosis

Ultrasound Scan Diagnosis					
Histopathology Analysis	**Agreement (%)**	**Expected Agreement (%)**	**Kappa**	**Z**	**P-Value**
Clinical	0.00	1.12	-0.011	-5.18	1.00
Endometrium	1.14	1.12	0.00	0.16	0.43
Myometrium	0.57	0.58	-0.0001	-0.11	0.54
Cervix	2.29	2.76	-0.005	-1.70	0.96
Ovary	1.14	1.12	0.002	0.11	0.46
Fallopian tube	1.72	1.72	0.00	0.00	0.50

4. Discussion

Globally, hysterectomy is the most performed surgery in gynaecological practice because it provides a definitive cure for many diseases affecting the uterus and adnexae and provides accurate diagnosis. The operation is successful in terms of symptom relief and patient satisfaction [8, 9]. The clinical indications for performing this major surgery must always be justified, as it has psychological, emotional, medical, hormonal, and sexual consequences for a woman's life.

Approximately 90% of gynaecological surgeries are performed to treat benign conditions with the goal of improving patients' quality of life [10]. This surgery has an excellent outcome in terms of patient satisfaction, symptom relief, and complete cure of uterine and adnexal diseases [11].

This study was carried out to evaluate the patterns of lesions in hysterectomy specimens at our institution and to correlate the results with clinical indications and histopathology findings. It was also to compare our results to those of other researchers.

In our study, the majority of the 202 hysterectomies were performed between the ages of 35 and 44, with the fewest occurring between the ages of 55 and 64. These findings are consistent with previous research conducted [12-14]. The abdominal route was the most used method of hysterectomy. Abdominal hysterectomies were performed in 93.8% of cases, and vaginal hysterectomies in 6.2% of cases, which is comparable to other reports [12, 15-18].

Vaginal hysterectomy was primarily used for uterovaginal prolapse, while the abdominal route was used for a variety of other indications. Similar indications were addressed using the same routes [17]. No organs were damaged during the procedures. This could be because all hysterectomies were carried out by highly skilled and experienced consultant gynaecologists. Only a few cases had undergone bilateral salpingo-oophorectomy and hysterectomy. This could be because many of the women were of reproductive age, and the procedure was performed for primarily benign conditions. However, this finding is at variance with the report from other researchers [16, 19, 20]. This difference could be attributed to the older age of the women in the latter studies.

The most common reason for hysterectomy in our study was uterine fibroids, which is consistent with previous reports in the literature [3, 13, 19, 20, 21]. Histopathological examination of

specimen is useful for both diagnosis and treatment. In practice, a variety of conditions may necessitate the removal of the uterus despite the lack of gross features, which may reveal microscopic pathology upon examination by a pathologist [22].

The most common endometrial pathology was proliferative endometrium, followed by secretory endometrium. Similar findings to the current study were obtained by Usha *et al*. [23] Rather *et al*. [3] and Imam *et al*. [24] In addition, Verma *et al*. [4] identified proliferative endometrium as the most common finding. Other researchers also made similar observations [13, 17, 20, 25]. This concordance may be due to the women in these studies being of similar ages. Conversely, Chaudhari and Shekhar[26] and Gupta *et al*. [18] discovered that disordered proliferative endometrium and physiological endometrium were the most common endometrial findings, respectively. However, according to Mishra *et al*. [27], endometritis was the most common finding. These findings may differ depending on the primary age group undergoing hysterectomy and the reason for hysterectomy in the hospital whose records were being investigated. Previous studies identified atrophic endometrium and simple endometrial hyperplasia as the most common endometrial pathologies [11, 17, 28, 29].

The most common myometrial finding was Leiomyoma. Other researchers reported similar findings [11, 13, 17, 18, 20, 27, 29-31]. Adenomyosis, defined as the presence of endometrial glands and stroma deep within the myometrium, is the second most common myometrial pathology in this study. Adenomyosis is rarely diagnosed preoperatively and remains underdiagnosed due to the lack of specific symptoms. Transvaginal ultrasonography can aid in the diagnosis of adenomyosis when performed by a qualified professional. However, the diagnosis can only be confirmed after the uterus is removed and histopathologically assessed [32]. Some of the specimens contained multiple lesions in the uterus, including ten cases of leiomyoma and adenomyosis. Previous studies reported comparable findings [3, 11, 20, 29, 31, 33].

In 6.9% of cases, dysfunctional uterine bleeding (DUB) was diagnosed before the operation. Only three cases had cystic glandular hyperplasia, which is consistent with the diagnosis of DUB, while the remaining women who underwent hysterectomy for this diagnosis had adenomyosis, endometrial polyp, secretory endometrium, or disordered proliferative endometrium. Other authors made similar observations [13, 30].

Chronic cervicitis was identified as the most common pathological finding in the cervix. Similar findings were reported by Sivapragasam *et al*, Vani *et al*, and other authors [20, 25, 26, 27, 34, 35]. Six cases of cervical dysplasia (CIN) were identified in the current study. This is similar to the study conducted by Ramachandran *et al*. [36]

The most common ovarian histopathological finding was simple follicular cyst. This has also been observed in several previous studies [25, 33]. In the current study, a histopathological examination revealed no pathological lesions in the fallopian tubes. Other authors have made similar observations [13].

In the current study, the correlation between clinical diagnosis and histopathologic diagnosis ranged from 88.6% to 100% confirmation. This was comparable to previous studies [18, 37, 38]. The high degree of correlation could be attributed to extensive preoperative clinical and radiological evaluations in a tertiary care hospital.

5. Conclusion

The research sheds light on the diverse histopathological patterns of uterine, cervix, and adnexal lesions found in hysterectomy specimens. The most common uterine pathologies were leiomyoma and adenomyosis, while chronic cervicitis was the most common pathology in the cervix in hysterectomy specimens. Microscopic examination and clinicopathological correlation are required because a clearly visible benign lesion may contain a malignant focus. As a result, it is critical that every hysterectomy specimen be subjected to a thorough gross and histopathological examination for optimal postoperative management.

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Conflict of Interest

The authors have no conflict of interest to declare.

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