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Endometrial histological patterns and associated factors of abnormal uterine bleeding among women seeking gynecological services from referral hospitals in Western Uganda: a cross-sectional study

Joan Logose¹, Marie Pascaline Sabine Ishimwe², Moses Kabali⁴, Emmanuel Okurut¹, Emmanuel Eliu³, Adam Ddamulira¹ and Theoneste Hakizimana^{1*}

Abstract

Background Women of all ages are susceptible to abnormal uterine bleeding (AUB), a relatively frequent gynecological issue. In the gynecology outpatient department, abnormal uterine bleeding is a problem that affects one-third of the patients, making them feel less financially secure and have a lower quality of life. Our study aimed to determine the endometrial histological patterns and factors associated with abnormal uterine bleeding among women seeking gynecological services from referral hospitals in western Uganda.

Methods A cross-sectional study was conducted from June 2023 to September 2023. We systematically enrolled 361 participants after getting consent. A structured questionnaire was used to collect information needed for analysis. The endometrial samples were collected immediately from eligible patients with Abnormal Uterine bleeding and taken to the histopathology laboratory for examination. Descriptive statistics followed by binary logistic regression were conducted to achieve the study objectives.

Results The study enrolled 361 participants with the mean age was 32.7 years (SD = 12.5). Of the total participants, 54 (14.96%) had Abnormal Uterine bleeding. The common endometrial histological patterns among women with Abnormal uterine bleeding were; proliferative endometrium 21 (38.9%), simple endometrial hyperplasia without atypia 11 (20.4%), and secretory Endometrium 6 (11.1%). Women with BMI ranging between 25 and 29.9 [aOR = 5.61 (1.42–22.19), $p = 0.014$], those with a history of genital infection in the past 1 year [aOR = 2.49 (1.2–5.13), $p = 0.013$], those who were nulliparous [aOR = 13.31 (4.94–35.82), $p = 0.001$], Primiparous [aOR = 4.32 (1.83–10.16), $p \leq 0.001$] and women who reported HIV positive serostatus [aOR = 3.65 (1.74–7.66), $p = 0.001$] were independently associated with Abnormal Uterine Bleeding at Fort portal Regional Referral hospital.

*Correspondence:
Theoneste Hakizimana
theonestehakizimana5@gmail.com

Full list of author information is available at the end of the article



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Conclusions and recommendations The prevalence of AUB was within the global range. Simple endometrial hyperplasia without atypia and chronic endometritis were the commonest pathological patterns. BMI, History of genital infection, nulliparity, primiparity, and HIV serostatus were the factors that were independently associated with abnormal uterine bleeding. There is a need for routine endometrial sampling for all eligible women with abnormal uterine bleeding at FRRH.

Keywords Abnormal uterine bleeding, Endometrial histological patterns, Gynecological services, Referral hospitals

Introduction

Abnormal uterine bleeding refers to uterine bleeding in a non-pregnant female that is abnormal in volume (>80 ml), frequency, duration (>7 days), or regularity. Its complications are still a massive global burden, with a global prevalence of between 4 and 52% in women of reproductive age [1]. A study done in Iran (Western Asia) found that 35.8% of the participants suffered from one or more types of AUB; 10.6% of them had disturbances of regularity; 23.8% reported disturbances of frequency; 16% reported disturbances of the heaviness of flow; 11.5% reported disturbances of the duration of flow; and about 4.3% of the women reported irregular non-menstrual bleeding [2]. The prevalence of AUB in Africa is reported to range from 5 to 65% among reproductive-age women in a study conducted in Ethiopia [3]. In a study conducted in rural Gambia, out of 607 women who were menstruating but not using hormonal contraception, 16% reported irregular cycles, 14% dysmenorrhea, 8% spotting, and 4% severe or prolonged bleeding to their doctor [4].

The prevalence of AUB in East Africa was found to be 3–33% in a study done in Kenya [5]. AUB has a significant negative impact on physical and emotional role functioning, which hinders work productivity and other everyday tasks [6].

The gold standard diagnostic method for assessing and evaluating abnormal uterine bleeding is the histopathological analysis of endometrial biopsies [7]. The samples may be collected quickly, safely, and with a high degree of diagnostic accuracy and analyzed by a practicing pathologist to demonstrate a range of histopathological patterns, such as infections, medication use, hormonal effects, and normal to aberrant cyclical changes [8]. Endometrial sampling is only performed on patients who are at high risk for developing atypical hyperplasia or cancer, obese, not responding to medical treatment, or above 35 years of age [9].

Despite the high prevalence of AUB, there is limited research examining how to diagnose and manage women in areas with limited resources who have irregular uterine bleeding [10]. To prevent over- and under-treating patients, it is crucial to keep the patient's history in mind when reading the histopathological data from D&C [6].

Abnormal uterine bleeding is associated with extremities of age in adolescents due to anovulatory bleeding [11] and in perimenopausal women [12]. Women who

are unemployed or have low socioeconomic status tend to have AUB as well as those in demanding and stressful jobs due to the impact of chronic stress on hormonal balance [2, 13]. According to a Kenyan study, peri-urban women are more likely to seek health care and may receive an earlier diagnosis and course of treatment in the preclinical stage, which reduces the chance that the condition will progress to the disease stage [5]. Uneducated women or those with a lower level of education tend to be more affected by AUB and tend to have more severe illnesses. In a study carried out in Iran, it was found that 75% of the women with AUB had attained less than a diploma in education level [2]. AUB is more commonly diagnosed in multiparous women than in nulliparous women [14, 15]. A study carried out in Pakistan showed that most of the women with AUB were para 6 (28.2%) and para 5 (28.2%), followed by para 4 (18.2%) and para 3 (17.3%), while only 8.2% were para 1 [16]. HIV infection, obesity, and the presence of underlying genital tract infection, whether sexually transmitted infection or urinary tract infection, predispose to AUB [3, 17].

In an Indian investigation, the most prevalent pattern among these patients was 28.4% of normal cycling endometrium, followed by disrupted proliferative pattern (20.5%), benign endometrial polyp 11.2%, endometrial hyperplasia 6.1%, carcinomas 4.4%, and chronic endometritis 4.2% [12]. A similar study in India revealed that the most frequent histological finding, observed in 25% of women, was endometrial hyperplasia. Secretory endometrium was found in 16.7% of women, while proliferative phase pattern and disordered proliferative endometrium were found in 12.2% of women each, and endometrial cancer was seen in 6.4% of cases [18]. In a study carried out in Pakistan, the most commonly seen organic lesions were endometrial hyperplasia in 30%, endometrial polyps in 12%, and chronic endometritis in 13% [19]. A study carried out in Western Nigeria to assess endometrial pathologies showed that 53.8% of the cases had functional endometrial alterations. In addition, there were malignant neoplastic lesions at 3.9%, partial hydatidiform moles at 2.3%, complete hydatidiform moles at 2.1%, endometritis at 7.8%, and simple endometrial hyperplasia at 5.8% [20]. There is scanty data on AUB in Uganda. Unpublished data from HMIS FRRH records of both inpatients and outpatients from June 2022 to August 2022 showed that 82 (19.9%) of women had AUB

and none underwent endometrial sampling regardless of eligibility. This study aimed to determine the prevalence, histological patterns, and associated factors of abnormal uterine bleeding among women seeking gynecological services from referral hospitals in western Uganda.

Methods

Study design, population, and setting

This was a descriptive cross-sectional study carried out at Fort Portal Regional Referral Hospital (FRRH) from June 2023 to September 2023. The study was conducted at the gynecological ward and outpatient clinic of the Obstetrics and Gynecology department of FRRH. FRRH is a public hospital in western Uganda. It is located in the Fort Portal town of Kabarole district, which is approximately 300 km west of the capital city of Kampala. The in-patient capacity of FRRH is 350 beds distributed in all departments, with 105 beds within the obstetrics and gynecological departments. The hospital has a modern, accredited laboratory able to carry out most of the tests, but it doesn't have a pathologist to carry out histopathological analysis. The study participants came from catchment areas such as Kabarole, Bundibugyo Kamwenge, Kasese, Ntoroko, and Kyenjojo districts. This study involved all women seeking gynecological services at FRRH.

Inclusion criteria

All women of reproductive age who sought gynecological services at FRRH and consented to take part in this study were included.

Exclusion criteria

Pregnant women or women who had pregnancy-related bleeding complications; those who were virgins on clinical examination and those using modern family planning methods were excluded from the study.

Sample size determination

We determined the Sample size using the modified Daniels formula (Daniel, 1999).

$$N = \frac{Z^2 p(1-p)}{e^2}$$
, Where $Z = 1.96$, $q = 1 - p$ and $P = 42.77\%$ proportion for proliferative histological pattern in a study done in Ethiopia [3].

$$N = \frac{1.96^2 * 0.341(1-0.341)}{0.05^2} = 349$$
 Participants. The minimum calculated sample size for this study was 349 participants. To enhance the precision of estimates and account for potential non-respondents and incomplete data, we recruited and analyzed a total of 361 participants who were available and provided informed consent during the study period.

Study procedure

Eligible study participants were systematically recruited (every 2nd participant) from the gynecological ward and gynecological outpatient clinic until we reached the desired sample size. The primary investigator initially provided the details of the study, including the study objectives, benefits of the study, and eligibility criteria. The researcher and research assistants administered a pre-tested questionnaire to all participants after getting informed consent. Participants were identified using number codes. For reasons of privacy and confidentiality, information about respondents was kept secret throughout the research process. To rule out pregnancy-related bleeding, a urine HCG test was done for all women. Those who presented with AUB and were eligible underwent a vaginal speculum exam to assess obvious causes such as macroscopic lesions and to ascertain that bleeding is truly of uterine origin, followed by endometrial sampling using a Manual Vacuum Aspirator. The participants who refused to consent and participate in the study were managed according to hospital protocol.

Endometrial sampling procedure

Endometrial sampling was performed on eligible women who were at high risk for developing atypical hyperplasia or cancer, obese, not responding to medical treatment, or above 35 years of age. The research assistants made a list of women who presented with AUB according to detailed history taking followed by a speculum exam to ascertain that bleeding is truly of uterine origin. Within 30 min of contact with the participant, endometrial samples were taken from 2 evacuation rooms in the department by the researcher and 2 trained research assistants using an MVA set after administration of a paracervical block with lignocaine. Before tissue processing, endometrial specimens were fixed in 10% neutral buffered formalin and transported to the histopathology laboratory of Mbarara Regional Referral Hospital after 24 h. Every endometrial histological pattern identified was confirmed by two pathologists to avoid error, and the histology request form was countersigned accordingly.

Study variables

Independent variables included sociodemographic, medical, and obstetric factors associated with abnormal uterine bleeding. The dependent variable was abnormal uterine bleeding.

Quality control

Training was provided to all research assistants on the use of research tools. The questionnaire was completed and cross-checked for completeness every day by the researcher or research assistants. To ensure accurate information, a translated version of a questionnaire was

used for participants who didn't know or understand English. All participants had an equal chance of being chosen for the study, and since we utilized a power of 80% while computing, inclusion criteria were strictly followed, and the sample size was adequate. Priority was not granted based on a person's race, ethnicity, or religion. The participants were not given any financial or other incentives to participate in the study. Every endometrial histological pattern identified was confirmed by two pathologists to ensure the accuracy of the results.

Ethical approval

This research project was approved by the research ethics committee of Bishop Stuart University and the administration of FRRH under registration number BSU-REC-2023- 112. The study was registered with the Uganda National Council for Science and Technology (UNCST). All study participants provided their written consent.

Data analysis

Data collected from questionnaires was entered into Microsoft Excel 2016 and imported to SPSS version 22.0. Descriptive statistics were performed to determine the basic demographic characteristics of participants, the prevalence of AUB, and its endometrial histological patterns. AUB prevalence was calculated as a percentage of the number of participants with AUB out of all participants recruited in the study. For each of the observed endometrial histological patterns, frequency and percentages were calculated. AUB-related factors were evaluated using binary logistic regression. Biologically plausible factors and those with a p -value of less than 0.2 at the bivariate level were included in the multivariate analysis. Factors with $p \leq 0.05$ were considered significant in this study. Before conducting multivariable logistic regression, multicollinearity was assessed using the Variance Inflation Factor (VIF) and tolerance values, with no significant collinearity detected among the independent variables. Model fitness for the final multivariable logistic regression model was evaluated using the Hosmer-Lemeshow goodness-of-fit test, which indicated an adequate model fit ($p > 0.05$).

Results

Basic characteristics of study participants

The study was conducted from both the gynecological ward and clinic and enrolled 361 participants with a 100% response rate. The majority of them ranged between 20 and 39 years of age (219, 60.66%), married (259, 71.75%), from rural areas (256, 70.91%), with primary or lower education (293, 81.16%), housewives (249, 69.98%), and earning < 250,000 Ugandan shillings per month (228, 79.78%) Table 1. In this study, 281 (77.84%)

of participants were multiparous, 285 (78.95%) had no history of genital infections in the past year, 348 (96.40%) had no history of diabetes mellitus, 294 (81.44%) had no known hypertension, 291 (80.61%) had negative HIV serostatus, and 343 (95.01%) had a BMI (weight/height) ranging between 18.5 and 24.9. Table 1.

Histological patterns of endometrial sampling among women with AUB seeking gynecological services at FRRH

A total of 361 study participants were recruited, of whom 54 had abnormal uterine bleeding and underwent endometrial sampling. The prevalence of AUB among women seeking gynecological services at FRRH was 14.96%.

The common histological patterns of endometrial sampling among women with AUB seeking gynecological services at FRRH were proliferative endometrium 21(38.9%) followed by simple hyperplasia without atypia 11(20.4%), secretory endometrium 6(11.1%) and Chronic endometritis 6(11.1%), leiomyoma 4(7.4%), disordered proliferative endometrium 3(5.6%) and endometrial adenocarcinoma 3(5.6%) Fig. 1.

Factors associated with AUB among women seeking gynecological services at FRRH

Bivariate analysis (Table 1) showed that age, parity, BMI, Genital infections, and HIV status were associated with abnormal uterine bleeding ($P \leq 0.2$). At the multivariate level of analysis, results from a multivariate analysis (Table 2) at a 95% CI with a $p \leq 0.05$ as a statistically significant level revealed that overweight (BMI 25–29.9), history of genital infection, nulliparity, primiparity, and positive HIV serostatus remained factors independently associated with abnormal uterine bleeding among women seeking gynecological services at FRRH.

Precisely, mothers with a BMI ranging between 25 and 29.9 (aOR = 5.61, 95% CI: 1.42–22.19, $p = 0.014$) were five times more likely to have AUB. Those who were nulliparous (aOR = 13.31, 95% CI: 4.94–35.82, $p = 0.001$) and primiparous (aOR = 4.32, 95% CI: 1.83–10.16, $p < 0.001$) were respectively 13 and 4 times more likely to have AUB. Finally, women who reported to have a history of genital infection in the past year (aOR = 2.94, 95% CI: 1.21–5.13, $p = 0.013$) and HIV-positive serostatus (aOR = 3.65, 95% CI: 1.74–7.66, $p = 0.001$) were respectively 2.4 and 3.6 times more likely to have AUB.

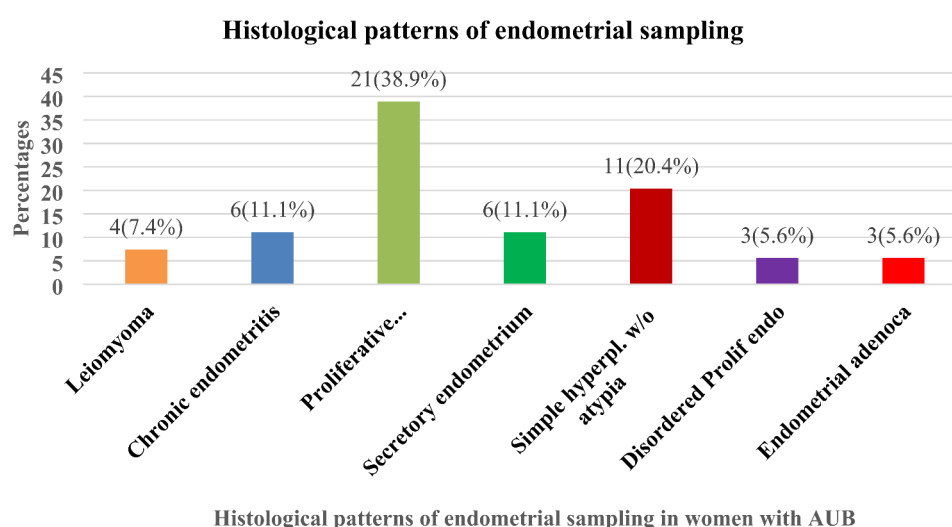
Discussion

The overall prevalence of abnormal uterine bleeding was 14.96%. This finding is comparable to a study in South western Nigeria where 10% of the women seeking gynecological care had AUB [20] and also within the worldwide prevalence of AUB, which is between 3 and 30% [6, 10]. This could be because the study was carried out on women of similar socio-demographic characteristics as

Table 1 Bivariate analysis for sociodemographic, medical, and obstetric factors associated with abnormal uterine bleeding (N = 361)

Variables	Categories	Abnormal uterine bleeding (AUB)		cOR [95% - CI]	P value
		No(n = 307)	Yes(n = 54)		
Age	< 20	11(64.71)	6(35.29)	3.44(1.18–10.0)	0.023*
	20–39	189(86.30)	30(13.70)	Ref	
	≥ 40	107(85.60)	18(14.40)	1.06(0.56–1.99)	0.857
Marital status	Single	84(82.35)	18(17.65)	1.33(0.71–2.46)	0.37
	Married	223(86.10)	36(13.90)	Ref	
Residence	Rural	220(85.94)	36(14.06)	0.79(0.43–1.47)	0.457
	Urban	87(82.86)	18(17.14)	Ref	
Education level	≤ Primary	252(86.01)	41(13.99)	Ref	
	Secondary	40(80.00)	10(20.00)	1.54(0.71–3.31)	0.273
	Tertiary	15(83.33)	3(16.67)	1.23(0.34–4.43)	0.752
Monthly income(UGX)	< 250,000	243(84.38)	45(15.63)	Ref	
	250,000–500,000	56(88.89)	7(11.11)	0.68(0.29–1.58)	0.363
	> 500,000–1,000,000	8(80.00)	2(20.00)	0.71(0.28–6.57)	0.71
Parity	Nulliparous	21(52.50)	19(47.50)	10.65(4.99–22.73)	< 0.001*
	Primiparous	27(67.50)	13(32.50)	5.67(2.57–12.51)	< 0.001*
	Multiparous	259(92.17)	22(7.83)	Ref	
Genital infection	Yes	55(71.37)	21(27.63)	2.91(1.57–5.42)	0.001*
	No	252(88.42)	33(11.58)	Ref	
Diabetes mellitus	Yes	10(76.92)	3(23.08)	1.75(0.46–6.57)	0.409
	No	297(85.34)	51(14.66)	Ref	
Hypertension	Yes	58(86.57)	9(13.43)	0.86(0.40–1.86)	0.698
	No	249(84.69)	45(15.31)	Ref	
HIV serostatus	Positive	49(70.00)	21(30.00)	3.35(1.79–6.26)	< 0.001*
	Negative	258(88.66)	33(11.34)	Ref	
BMI	< 18.5	5(55.56)	4(44.44)	3.23(0.57–18.13)	0.183*
	18.5–24.9	296(87.57)	42(12.43)	Ref	
	25–29.9	6(42.86)	8(57.14)	6.46(2.00–20.87)	0.002*

* $P \leq 0.2$, cOR: crude odds ratio, CI: Confidence interval, BMI: Body Mass Index, UGX: Uganda shillings

**Fig. 1** Bar chart representing common endometrial histological patterns of women with AUB seeking gynecological services at FRRH

those in our study, but also because these were at tertiary referral hospitals similar to our study settings.

The prevalence of AUB in our study was higher than the prevalence from other studies conducted in Africa,

such as in Kenya at Moi Teaching and Referral Hospital, where the prevalence of AUB was 3.96% [5], and in Cameroon, 3.7% [21]. The difference could be due to the study duration since the Kenyan study was carried out

Table 2 Multivariate analysis for factors associated with abnormal uterine bleeding

Variables	Categories	cOR (95% - CI)	P value	AOR (95% - CI)	P value
Age	< 20	3.44(1.18–10.0)	0.023	0.69(0.17–2.79)	0.607
	20–39	Ref		Ref	
	≥ 40	1.06(0.56–1.99)	0.857	1.16(0.55–2.43)	0.698
BMI	< 18.5	3.23(0.57–18.13)	0.183	6.49(0.94–44.90)	0.058
	18.5–24.9	Ref		Ref	
	25–29.9	6.46(2.00–20.87)	0.002	5.61(1.42–22.19)	0.014
Parity	Nulliparous	10.65(4.99–22.73)	< 0.001	13.31(4.94–35.82)	0.001
	Primiparas	5.67(2.57–12.51)	< 0.001	4.32(1.83–10.16)	< 0.001
	Multiparous	Ref		Ref	
Genital infection	Yes	2.91(1.57–5.42)	0.001	2.49(1.21–5.13)	0.013
	No	Ref		Ref	
HIV serostatus	Positive	3.35(1.79–6.26)	< 0.001	3.65(1.74–7.66)	0.001
	Negative	Ref		Ref	

over a 1-year period and this study was carried over for a period of 3 months, which could also be attributed to socio-demographics and economic variations in the study population.

The prevalence of AUB in our study was lower than other studies, such as a study done in rural Gambia, which showed the prevalence of AUB to be 42% [4]; in Iran, it was 35.8% [2]; and in South West Ethiopia, it was 34.1% [3]. This variation in prevalence is likely due to differences in the study settings, socio-demographic and economic variations, as well as the study period.

In this study, 54 endometrial samples were examined for histological findings and showed that the commonest histological patterns of endometrial sampling among women with AUB were proliferative endometrium 38.9%, followed by simple hyperplasia without atypia 20.4%, secretory endometrium 11.1%, chronic endometritis 11.1%, leiomyoma 7.4%, disordered proliferative endometrium 5.6%, and endometrial adenocarcinoma 5.6%.

Our study findings are almost similar to those found in other studies assessing endometrial histological patterns among women with abnormal uterine bleeding. For example, in a study carried out in India, the commonest pattern was normal cyclic endometrium (which included both proliferative and secretory patterns) at 28.4%. Others were leiomyoma (11.2%), endometrial hyperplasia (6.1%), carcinomas (4.4%), and chronic endometritis (4.2% [12].

Another study in India showed the most common histological pattern to be a proliferative pattern (50.39%), followed by endometrial hyperplasia (23.43%), and the least common pattern was malignancy (0.39%) [22].

Our study was very similar to a study carried out in Western Nigeria, which revealed that functional endometrial changes were the most common histopathological findings, accounting for 53.8% of the cases. Other pathological diagnoses included endometritis (7.8%),

simple endometrial hyperplasia (5.8%), and malignant neoplastic lesions (3.9% [20].

Our findings have been largely found to be associated with simple endometrial hyperplasia, chronic endometritis, leiomyoma, disordered proliferative pattern, and endometrial adenocarcinoma as the commonest pathologies in women with AUB. We, however, did not find atrophic endometrium or complex endometrial hyperplasia, as noted by Alshdaifat in Jordan [23]. This could likely be due to our study population, which included women aged 18–60 years, whereas their study women aged 19–86 years, and probably also due to the study period, which was over 5 years whereas our study period was only 2 months. The variety of histological patterns in this study suggests that AUB can have diverse etiologies, necessitating careful diagnostic evaluation.

Our study found that being overweight (BMI between 25 and 29.9) was significantly associated with abnormal uterine bleeding. Women who were overweight were five times more likely to have abnormal uterine bleeding as compared to women with a normal BMI. This finding is consistent with the results of a population-based study carried out in Iran that showed a strong association between AUB and increased BMI [2]. Current studies suggest that obesity affects the hypothalamic-pituitary-gonadal axis, resulting in increased metabolism of sex steroids within adipose tissue depots that decreases circulating Sex Hormone Binding Globulin (SHBG) levels with higher bioavailable sex-steroid levels, which changes the plasma concentration of androgens and estrogens and hence AUB [2].

In this study, women who reported HIV-positive serostatus were four times more likely to have AUB compared to the women who reported HIV-negative serostatus. This finding is consistent with a cross-sectional study carried out in Canada that found a high prevalence of abnormal uterine bleeding among women with HIV. A study carried out in Kenya found a high prevalence

of AUB among HIV serostatus-positive women. It was stated that HIV infection can lead to immune dysfunction, which may increase susceptibility to gynecological infections and inflammatory conditions that can result in AUB [24].

In this study, women with a history of genital infection in the past year were two times more at risk of having abnormal uterine bleeding than participants who did not have it. This was similar to a study that was carried out in Ethiopia and stated that the presence of genital infections was associated with abnormal uterine bleeding with an odds ratio of 2.2 [3]. This association can be explained by the fact that ascending infection results in irritation of the uterine inner lining (endometrium), leading to uterine dysfunction and hence abnormal uterine bleeding [25]. It was also explained that persistent infection with high-risk strains of human papillomavirus (HPV) can lead to cervical dysplasia, which is a precancerous condition. Cervical dysplasia can then cause AUB [26].

In this study, nulliparous and primiparous women were respectively 6 and 10 times more likely to have AUB compared to the women who were multiparous and participated in this study. This finding is contrary to several studies that were carried out to assess the association between AUB and parity. A study done in Jordan (Western Asia) found that nulliparous women were less likely than multiparous women to present with AUB. The innate effect of parity is connected to cancer and hyperplasia in the endometrium, which is caused by estrogen [6]. Other studies also found that AUB is more commonly diagnosed in multiparous women than in nulliparous women [14, 15].

Study strengths and limitations

This is the first documented study done in the region, particularly in Uganda, to describe endometrial histological patterns and factors associated with abnormal uterine bleeding among women seeking gynecological services, and for that, the results will be used as a baseline for other studies in the country. It was an institutional-based cross-sectional study, so the findings may not generalize to the entire population; however, they cover the biggest catchment areas in western Uganda. We additionally acknowledge that the study design is cross-sectional in nature, which limits our ability to draw causal inferences.

Conclusions

The prevalence of abnormal uterine bleeding at Fortportal Regional Referral Hospital was within the global range. The common endometrial histological patterns of endometrial sampling among women with abnormal uterine bleeding were proliferative endometrium, simple hyperplasia without atypia, secretory endometrium, chronic endometritis, leiomyoma, disordered

proliferative endometrium, and endometrial adenocarcinoma. BMI, history of genital infection in the past year, nulliparity, primiparity, and HIV serostatus were the factors that were independently associated with abnormal uterine bleeding.

There is a need for routine endometrial sampling for all eligible women with abnormal uterine bleeding at Fortportal Regional Referral Hospital. In cases where the endometrial biopsy cannot be obtained, eligible women with AUB at FRRH should be empirically managed as cases of simple endometrial hyperplasia or chronic endometritis in conjunction with history and physical examination. Intense health education on diet, healthy lifestyle modifications, and the importance of early seeking of medical services by health care providers should be encouraged to identify women at risk, treat infections, and hence reduce the incidence of abnormal uterine bleeding. There is need for another study on endometrial histological patterns and associated factors of abnormal uterine bleeding to be carried out in a multicenter setting for a better understanding of the general population.

Abbreviations

AUB	Abnormal uterine bleeding
FRRH	Fort Portal Regional Referral Hospital
BMI	Body Mass Index

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12905-025-03722-2>.

Supplementary Material 1

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Author contributions

JL, TH, EO, MPSI, MK designed and developed Proposal. JL, KM and TH did Data collection. TH performed statistical analysis. TH and JL drafted the initial manuscript. MPSI, AD and EE made contributions in the revision of the manuscript. The final manuscript was read and approved by all authors.

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Data availability

The dataset that was used and analyzed in this study is not publicly available due to ethical considerations. Upon reasonable request, Dataset used can be availed with permission of the corresponding author Dr Theoneste Hakizimana (email: Theonestehakizimana5@gmail.com).

Declarations

Human ethics and consent to participate

This research project was approved by the research ethics committee of Bishop Stuart University and the administration of FRRH under registration number BSU-REC-2023- 112. The study was registered with the Uganda National Council for Science and Technology (UNCST). All study participants

provided their written consent. All ethical standards were followed according to the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Department of Obstetrics and Gynecology, Kampala International University, Ishaka, Uganda

²Department of Pediatrics and Child Health, Kampala International University, Ishaka, Uganda

³Department of Microbiology, Kampala International University, Ishaka, Uganda

⁴Department of Pharmacy, Kampala International University, Ishaka, Uganda

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