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ORIGINAL ARTICLE

Prevalence, clinical presentation and factors associated with Uterine fibroids among women attending the Gynecology Outpatient Department at a large Referral Hospital in Southwestern Uganda

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ABSTRACT

Background: Uterine fibroids are the most common benign female gynecologic tumors. There are multiple risk factors, including age and reduced fertility. There is however a paucity of data on disease burden and risk factors among African populations.

Objective: We determined the prevalence, clinical presentation and factors associated with uterine fibroids among women at Mbarara hospital gynecology clinic, Uganda.

Methods: We conducted a cross sectional study from November 2018 to February 2019 on 319 women attending gynecology clinic. An abdomino-pelvic ultrasound scan was performed on each participant and data analyzed using Stata Version 13. Multivariable logistic regression was used to determine association between selected characteristics and uterine fibroid appearance. P value of less than 0.05 was interpreted as significant.

Results: The number of women with fibroids was 90 out of 319, representing a prevalence of uterine fibroids of 28.2%. About 67 (74.4%) of the participants with fibroids were symptomatic having pelvic pain 65 (72.2%), menorrhagia 57 (63.3%), pelvic mass 20 (22.2%) and failure to conceive 9 (10%). Women in age group of 31 – 50 years (adjusted OR 4.2; 95% CI,2.0 to 8.5), those separated from their spouses (adjusted OR 4.4; 95% CI,1.8 to 10.5), overweight (adjusted OR 4.9; 95% CI, 2.6 to 9.6), obesity (adjusted OR 4.1; 95% CI,1.6 to 10.5) were more likely to be diagnosed with uterine fibroids while delayed menarche (adjusted OR 0.4; 95% CI, 0.1 to 0.8) was protective.

Conclusion: The study found the prevalence of uterine fibroids to be high. Majority of patients were symptomatic at presentation with pelvic pain, menorrhagia, irregular menses and pelvic mass. Uterine fibroids cause significant morbidity among reproductive age women. The identified risk factors included overweight and age group of 31 to 50 years. We recommend Ultrasound scan in women of reproductive age attending gynecology clinic to detect uterine fibroids early in order to manage them promptly so as to prevent the associated complications.

Background

Uterine fibroids, also known as uterine myomas or leiomyomas, are benign, monoclonal tumors of the smooth muscle cells of the uterus.[1] Uterine fibroids are composed of smooth muscle cells, vascular smooth-muscle cells, fibroblasts and extracellular matrix (ECM).[2] They are non-cancerous tumors which are myometrial in origin.[3] It is uncommon for *fibroids* to develop into cancer (leiomyosarcoma) and this occurs in<0.1 % of cases.[4] They are the most common benign tumors in women of reproductive age and are asymptomatic in at least 50% of afflicted women.[5]

Transvaginal and abdominal ultrasound scanning is the golg standard method for diagnosis of uterine *fibroids* in terms of accuracy and availability, with magnetic resonance imaging being a close second option in complex clinical circumstances.[6,7] The management of uterine fibroids can be approached medically, surgically, and even by minimal access techniques.[6] According to a 2010 World Health Organization report, fibroids affect between 20 to 25% of women, and close to 235 million women representing 6.6% of global women population are estimated to be affected worldwide.[8,9] Etiology of uterine *fibroids* is unknown and advances have been made in understanding the hormonal factors, genetic factors, growth factors, and molecular biology of these benign tumors.[10] Uterine *fibroids* decrease the quality of life by causing significant morbidity among women of reproductive age and the clinical effects of

of these tumors are related to their local mass effect, resulting in pressure upon adjacent organs, pelvic pain or problems related to pregnancy, including infertility and repetitive pregnancy loss.[11] Some of the clinical manifestations are heavy and prolonged menstrual bleeding, anemia secondary to bleeding,[12] increased urinary frequency, and bowel disturbance.[13] As a consequence, uterine *fibroids* are ranked as the major reason for hysterectomy.[14]

The Previous studies suggest multiple risk factors for developing *fibroids* but the exact etiology of *fibroids* is unknown. Uterine *fibroids* have been found to be commonly associated with age within the reproductive age group (35 to 49) but the rate of increase slows at older ages suggesting older premenopausal uterus is less susceptible to fibroid development.[15] Other risk factors for *fibroids* include parity which has been and still is inversely associated with a risk of fibroid development and it's postulated that during postpartum uterine remodeling, there could be selective apoptosis of small lesions and ischemia during parturition has been proposed as a mechanism.[16,17]

Coffee and caffeine consumption are associated with increased levels of early follicular phase E_2, independent of alcohol or tobacco use[18] and may enhance sex steroid production. Other factors associated with uterine *fibroids* include early menarche, caffeine intake, reduced fertility, obesity, consumption of red meat, hypertension, diabetes mellitus.[19,20] However, there is still a paucity of data on disease burden and risk factors among African populations. This study was therefore undertaken to determine the burden, clinical presentation and factors associated with uterine *fibroids* in women attending gynecology outpatient department at Mbarara regional referral hospital in south western Uganda.

METHODOLOGY

Study design and population

We conducted across-sectional study among 319 women seeking services at the gynecology outpatient department at Mbarara regional referral hospital (MRRH) between November 2018 and February 2019. Mbarara Hospital is a public regional referral hospital that serves as a teaching hospital for Mbarara University of Science and Technology as well. The hospital serves as a referral for the south western region of Uganda for a population of about 3 million.

Mbarara regional referral hospital has different departments including radiology department where our study participants had their ultrasound scans were done. There's also a Gynecological Outpatient Department (GOPD) where these women were recruited from. Women are screened at the general Outpatient Department (OPD) and based on their symptoms are sent to the GOPD, but some women will present with referral notes directly having attended another health facility before MRRH.

Sample Size Calculation

We determined the sample size by using the Keish and Leslie (1995) formula as below;

$n= Z^2pq/d^2$ Where n=sample size; Z=1.96 (the Z score value corresponding to 95% level of confidence interval); p=percentage frequency of outcome factor in the population. For this study, we used the prevalence of uterine fibroids among women attending the gynaecology outpatient clinic in Nigeria.[21]

q=1 – p, d=0.05 which is the margin of error. Thus, the calculated sample size was 319.

Sampling Procedure

Women were told about the study by a research assistant, after their consultation was completed and invited to participate. Only those who provided voluntary informed written consent were eligible to participate in the study. They were consecutively recruited and underwent the study procedures, including ultrasound scan to ascertain presence or absence of fibroids.

Data Collection Procedure

The research assistants and principle investigator administered interviews translated into the local language of Runyankore. We collected data on basic demographics, medical factors, gynecological factors, obstetrical factors and lifestyle factor. The interviews were conducted after the patient consultation was completed to prevent interference from the routine clinical care.

Assessment for uterine *fibroids*: The primary outcome for this study was presence of uterine fibroids. The abdomino-pelvic ultrasound scan reports confirmed the diagnosis of uterine *fibroids* when there was presence of well-defined solid hypoechogenic or hyperechogenic mass in the uterus with or without calcifications. A specialist radiologist at MRRH conducted the ultrasound scan. The results were relayed back to the clinician for patient management and the same information was collected as part of the study variables.

Inclusion and Exclusion Criteria

We included women who were aged at least 18 years seeking health care at the GOPD at MRRH, regardless of the symptoms. Women who were below 18 years of age and those who did not consent to participate in the study were excluded from the study.

Statistical Analysis

The data was collected using the questionnaires and entered into REDCap then exported to the software Stata Version 13. Summary statistics were used to characterize the participants. The categorical variables like age group, marital status, age category at menarche, parity, history of use of oral contraceptives, and smoking, were summarized using percentages or proportions. We compared potential factors associated with uterine *fibroids* such as the socio-demographics characteristics for women with and those without uterine *fibroids*. Chi-squared test analysis for categorical variables was performed. We considered *P* values <.05 to be statistically significant. We used multivariable logistic regression analysis to identify factors independently associated with uterine fibroids. Backwards stepwise elimination was used to create the final model. Data from all participants enrolled into the study was included in the final analysis.

Ethical consideration

We obtained ethics approval from the Faculty of Medicine

Research Committee, Mbarara University, The Mbarara University Institutional Ethical Research Committee and administrative approval was sought from the office of the Executive Director at MRRH before the process of data collection started. We obtained final approval from the Uganda National Council of Science and Technology (Reference number is HS384ES). Informed consent was obtained from all respondents. Access to data was limited to those directly involved in the study by providing specific passwords and usernames to the Principle Investigator and the Research Assistants. The PI and Research Assistants had different levels of database access. The PI had rights to enter, export data and analyze the entered data while the Research Assistants had rights to enter data and save the data. The consent form was translated into the local language (Runyankole). Confidentiality was ascertained by interviewing the participants in a room where no other patients were. This helped the participants to have their information volunteered with ease knowing that no one else was listening through except the research assistants doing the interviews.

RESULTS

Three hundred nineteen (319) study participants were enrolled into the study, 90 (28.2%) of these had uterine fibroids. There were significant differences in age groups, marital status, body mass index and age of menarche between women with and those without uterine fibroids as summarised in Table 1.

Women with fibroids were older than those without and were mostly in the 31 to 50 age category. Majority of women with fibroids were separated from their husbands or were obese. Of the 90 cases with uterine fibroids 67 (74.4%) were symptomatic while 23 (25.6%) were asymptomatic and the Majority respondents with uterine fibroids had lower abdominal pain 72.2%, menorrhagia were 63.3%, irregular menses 50%, pelvic mass 22.2%, failure to conceive 10%, recurrent miscarriage 4.4% and urine retention 2.2% was the least common of the clinical presenting features (Table 2).

In multivariate logistic regression, Age group between 31 to 50 years (OR 4.2; 95% CI, 2.0 to 8.5, *P≤.001*), separation from spouse (OR 4.4; 95% CI, 1.8 to 10.5; *P<.002*), overweight (25 to 29.9kg/m2) (OR 4.9; 95% CI, 2.6 to 9.6; *P≤.001*) and obesity (>30kg/m2) (OR 4.1; 95% CI, 1.6 to10.5; *P<.004*), while late age of menarche (OR 0.3; 95% CI, 0.1 to 0.8; *P<.015*) maintained their significant association with uterine fibroids (Table 3).

DISCUSSION

The prevalence of uterine *fibroids* at Mbarara Regional Referral Hospital (MRRH) was 28.2%. This is comparable to findings from the studies elsewhere in sub Saharan Africa, notably in Nigeria[22] where the prevalence was 29.3% and Kenya prevalence of uterine fibroids ranged from 10 to 20% whereas in Ghana, it was 36 %.[3] The participants in all these studies share common features in the socio demographic characteristics and the studies were all conducted at tertiary hospital settings, similar to our study setting.

Our study found that majority of the study participants had symptomatic uterine fibroids at presentation.

TABLE 2: Clinical Presentation of Uterine Fibroids

Clinical presentation of uterine fibroids	Frequency n=90	Percentage (%)
Pelvic pain	65	72.2
Menorrhagia	57	63.3
Irregular menses	45	50
Pelvic mass	20	22.2
Failure to conceive	9	10
Recurrent miscarriage	4	4.4
Urine retention	2	2.2

The commonest clinical presenting symptoms included: pelvic pain, menorrhagia and irregular menses. Other clinical features included pelvic mass, failure to conceive, recurrent miscarriage and urine retention. These findings are in agreement with a study done in Ghana where the majority of these women had menstrual irregularities.[3] The study done in Nigeria found that pelvic mass was the commonest clinical presentation unlike in our study.[22] This is because study in Nigeria included only women with pelvic masses. Our study found majority of our participants were symptomatic unlike other studies that showed uterine fibroids were asymptomatic.[23-25] One potential explanation for this finding is that our study was hospital based where by patients presented with symptoms as the reason for attending while other studies screened community-based participants where the majority had no symptoms.

Our study found that women in the age group of 31 to 50 years were more likely to have uterine fibroids compared to other age groups, younger or older. This is similar to findings of other studies such as in Israel where uterine fibroids were more common among women between age of 31 and 50 years,[26] with similar findings in Nigeria and Ghana.[3] This could be explained by the exposure to high steroid hormones namely estrogen and progesterone during this period.[27] In our study setting, most women complete their family about 35 years and therefore they have the long fertile period without pregnancy which is a potential risk factor. We also found out that being separated from a spouse was significantly associated with having uterine fibroids. These findings are in agreement with those from a study done by Laughlin and group.[15] This finding may be explained by the long pregnancy free intervals characterized by the absence of ovarian activity which is the risk factor for uterine fibroids.

Our study found out that being overweight and obese were highly associated with having uterine fibroid which is similar to the other studies which showed high body mass index to be associated with fibroids.[3,28,29] This is because fat tissue converts testosterone into estrogen, and obesity can lead to decreased levels of a protein called sex hormone binding globulin that binds to estrogen and progesterone, resulting in more unbound hormones.[27]

These combined effects result in more estrogen and progesterone within the uterus, which may lead to fibroid development. The study also found late age of

TABLE 1: DemographicCharacteristics of Study Participants

Characteristics	All N=319	With uterine fibroids n=90	Without uterine fibroids n=229	Pvalue
Age in years				
<30	151(47.3)	20(22.2)	131 (57.2)	≤.001
31 – 50	142(44.5)	63(70.0)	79 (34.5)	
51 – 70	26(8.2)	7(7.8)	19 (8.3)	
Marital status				
Married	180(56.4)	21(23.3)	159 (57.2)	≤.001
Separated	66(20.7)	51(56.7)	15 (6.6)	
Single	42(13.2)	6(6.7)	36 (15.8)	
Widow	31(9.8)	12(13.3)	19 (8.3)	
Educational level				
None	20(6.3)	7(7.8)	13 (5.7)	.108
Primary	149(46.7)	43(47.8)	106 (46.3)	
Secondary	91(28.5)	18(20.0)	73 (31.9)	
Tertiary	59(18.5)	22(24.4)	37 (16.2)	
Body mass index (BMI)				
Under weight (<18.5)	11(3.5)	1(1.1)	10 (4.4)	≤.001
Normal (18.5-24.9)	147 (46.1)	19(21.1)	128 (55.9)	
Overweight (25-29.99)	127 (39.8)	55(61.1)	72 (31.5)	
Obese (>30)	34 (10.7)	15(16.7)	19 (8.3)	
Gynecological factors, n (%)				
Parity				
Nullipara (0)	45(14.1)	18(20)	27(11.8)	.172
Multipara(1-5)	202(63.3)	52(57.8)	150 (65.5)	
Grand multipara (>6)	72(22.6)	20(22.2)	52(22.7)	
Menarche				
Early (<12)	16(5.02)	4(4.4)	12(5.2)	.049
Normal (13-15)	267(83.7)	81(90)	186 (81.2)	
Late (>=16)	36 (11.3)	5(5.6)	31(13.5)	
Family planning , n(%)				
Oral contraceptive pills				
Yes	**33(20.8)**	**8(24.2)**	**25(19.8)**	**.580**
Medical factors , n(%)				
Hypertension				
Yes	21(6.6)	9(10)	12(5.2)	.129
Life style factors, n(%)				
Smoking				
Yes	16(5.0)	4(4.4)	12(5.2)	.770
Alcohol use				
Yes	67(21.0)	23(25.6)	44(19.2)	.212

n=frequency; %=Percentage

menarche (>16 years) was protective factor of uterine fibroid similar to findings of other studies.[30] This is because of delayed exposure to steroid hormones that predispose to fibroids.

Our study had some strengths: First, it was conducted in southwestern Uganda, making it one of the few studies to investigate this subject in resource limited settings. Secondly, the study involved a sizeable number of participants hence making our findings more generalizable to the population despite this being a hospital-based study.

However, our study had a limitation. The definitive diagnosis of uterine fibroids was not absolute since we were not able to conduct histology. We were making our conclusions based on the features of uterine fibroids on ultrasound and clinical examination.

CONCLUSION

TABLE 3: Factors Associated WithUterine Fibroids

Characteristics	Univariate OR (95% CI)	P-value	Multivariate OR(95%CI)	P-value
Age in years				
<30	Ref			
31-50	5.2(2.9 - 9.3)	.000	4.2(2.0 - 8.5)	≤.001
51-70	2.4(0.9 - 6.5)	.080	2.5(0.9 - 8.6)	.140
Body Mass Index				
Normal (18.5-24.9)	Ref			
Underweight (<18.5)	0.7(0.1 - 5.6)	0.714	0.6 (0.1 - 5.8)	.677
Overweight (25-29.9)	5.1(2.8 - 9.3)	0.000	4.9 (2.6 - 9.6)	≤.001
Obese (>30)	5.3(2.3 - 12.2)	0.000	4.1 (1.6 - 10.5)	.003
Marital status				
Married	Ref			
Separated	4.4(2.0 - 9.0)	0.000	4.4 (1.8 - 10.5)	.001
Single	0.5(0.2 - 1.3)	0.163	1.5 (0.5 - 4.6)	.443
Widow	1.9(0.8 - 4.3)	0.092	2.2 (0.8 - 5.8)	.124
Menarche				
Normal (13-15)	Ref			
Early (<12)	0.8(0.24 - 2.4)	0.852	0.9 (0.2 - 3.8)	.878
Late (>16)	0.4(0.2 - 0.9)	0.047	0.3 (0.1 - 0.8)	.014

CI confidence interval, OR odd ratio

Our study found the prevalence of uterine fibroids to be high. Majority of patients were symptomatic at presentation with pelvic pain, menorrhagia, irregular menses and pelvic mass. The factors associated with Uterine fibroids included; age group 31 to 50 years, high BMI, having separated from the spouse while late age at menarche was protective. We recommend routine ultrasound scanning in women of reproductive age attending gynecology clinic to detect uterine fibroids early in order to manage them promptly so as to prevent the associated complications. This will reduce on the morbidity associated with uterine fibroids. Weight reduction campaigns should be encouraged among women of reproductive age.

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