



(RESEARCH ARTICLE)



Anatomical location of uterine fibroids among women attending a tertiary health facility in a southern Nigerian population

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Abstract

Uterine fibroids are benign monoclonal tumours of the smooth muscle cells of the uterus and usually occur during reproductive age. Studies have revealed that it is more prone to women of African descent and the major factors responsible for this occurrence is yet to be accurately discovered. The study determined prevalence, sonographic location, and type of uterine fibroid among women undergoing ultrasound scan in Radiology Department of the University of Port Harcourt Teaching Hospital. The research was a retrospective study conducted from August to October 2019. Study population was 271 and included all consenting females within ages 18-55 years undergoing ultrasound scan at the study centre. Primary data was collected by direct interview using data collection sheet, parameters retrieved included age, marital status, parity and history of previous surgery, while secondary data collected from the Unit register and We extracted information about, presence, number and location of the fibroids from participant' medical records. This was done for only women with confirmed cases of uterine fibroids. Analysis of data was done using SPSS version 22 and presented in diagrams, tables, figures and charts where appropriate. Point Prevalence was found to be 33.9%, respondents within ages 31 to 35 years (26.4%) presented with the highest prevalence of fibroid. Multiple fibroids with two or more nodules were found to be the most common from ultrasound scan (64.8%). In terms of types, intramural had the highest occurrence at 61.9%. Tumours are most frequently located in the anterior wall of the uterus (14.4%). Type and location of fibroid was seen to be mostly intramural and on the anterior wall of the uterus, respectively. This study found prevalence of uterine fibroid to be 33.9%, also nulliparous women were found to have the highest incidence of uterine fibroids. The point prevalence value for the study population is high, therefore, we suggest that awareness campaign be increased in the region

Keywords: Parity; Point Prevalence; Ultrasound; Uterine fibroids; Women Health

1. Introduction

Uterine fibroids also known as leiomyomas are non-cancerous, monoclonal tumours of the smooth muscle cells of the uterus precisely myometrium and usually occur during reproductive ages [1]. These tumours are known to comprise the extracellular matrix primarily made of collagen, proteoglycans, and fibronectin [2]. Several symptoms are implicated with fibroids and they include, abnormal uterine bleeding, varied pelvic pressure and/or pain, increasing abdominal girth, urinary or rectal symptoms, and reproductive failure. When the uterus is subjected to examination, it may reveal increased size of uterus and irregularity in shape. Ultrasonography (USG) is the first-line investigation, and it reveals number, size, and location of fibroids. Three-dimensional ultrasound can give valuable information about relationship of fibroids with endometrial cavity [3-5].

The assessment of disease burden of women of African descent revealed that they are more likely to report with symptoms of fibroid which may be severe [6-7]. In an eight year (2000 – 2007) retrospective study carried out by [8]

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they revealed that the incidence of fibroid was 51.9% between the age range of 26-35 years and 44.6% between 36 – 45 years. Their comparative analysis showed that there was an increase in percentage of incidence of 3.1% within 3 years of the study. In 2006, Olotu and Oladipo [9] showed in their study that there was an age decline in onset of menarche which inadvertently caused an increase in the development of uterine fibroids Olufowobi et al. [10] established that women with fibroids even after treatment were less likely to be free from fibroids as there could be potential failures.

Various mechanisms have been implicated in the ways through which fibroids lead to infertility, some of which include the frequent occurrence of anovulatory cycles, deformities of the uterine cavity which interferes with the motion of sperm cells, obstruction of the proximal fallopian tubes, secretion of vasoactive substances that inevitably lead to endometrial changes to mention a few [3,5,11].

Infertility has been reported as being associated with uterine fibroids, its adverse effects are majorly aligned with the location of the fibroid, the worse effects were observed especially with fibroids located submucosally. Though fibroids may not bear sole responsibility for infertility in majority of the cases, their impact in the distortion of the uterine cavity cannot be downplayed [12]. Ekwere et al. [13] reported that 7.4% of infertility cases presented with uterine fibroids in their study conducted in Calabar. Since fibroids are more common in nulliparous women when compared with parous women, this is indicative of a direct relationship between fibroids and infertility. IVF-intracytoplasmic sperm injection (ICSI) has been used in the studies of the relationship between fertility and fibroids, this led to some conclusion that submucosal fibroids are more detrimental than subserosal, while the impact of intramural fibroids on fertility is still under controversy. Based upon research that is available, in decreasing order of interference of fibroids based upon location to fertility is submucosal, intramural and subserosal [14].

The aetiology of fibroid is not clearly understood however factors such as genetic changes, hormones (oestrogen and progesterone) race, heredity, body mass index (BMI, kg/m) have been associated with a modest increased risk of uterine leiomyoma in several but not in all studies [15]. In reproductive years, myomas increase and during menopause they regress. This suggests that there is a method of cyclical regulation from the secretions of oestrogen and/or progesterone for the development. Even though it is the entire uterine wall that is exposed to these secretions, some parts of the wall show highly increased or decreased sensitivity which results in fibroids. What causes this phenomenon to occur is still largely unknown [4, 5, 11].

2. Material and methods

The University of Port Harcourt Teaching Hospital serves as a reference hospital in the south-southern region of Nigeria and therefore provides a wide range of consultancy services for patients and therefore is a good point of reference for data collection for a representational study of the state.

The study was a retrospective descriptive cross-sectional study conducted from August 2019 to October 2019 and required meeting with patients' and accessing their medical records from the Radiology department of the University of Port Harcourt Teaching Hospital. Three instruments of diagnosis were applied for the collection of data; subjects were interviewed through questionnaires, subjects were also examined in the outpatient clinic Department of Gynaecology and finally transabdominal, transvaginal, pelvic and obstetric sonographic techniques were employed on different subjects to obtain images at the department of Radiology to diagnose the location, positions and numbers of fibroid. Access to participants' medical records was granted by the Head of Department of Radiology. Participants who participated in the study gave full consent. Primary data was collected using a data collection sheet, parameters recorded included age, presence of tumour, number of tumour nodules, location of tumour while secondary data was collected from the register and subjects result duplicates included marital status, parity, history of previous removal of fibroid.

Sample population included all females who presented at the Radiology Department of the University of Port Harcourt Teaching Hospital. Sample size was determined using Cochran's formula where population size is unknown and with standard deviation of 50%. Inclusion criteria included women who gave their full consent, were within age range 18-55 years and came to the Radiology department for Ultrasound scan-these formed the sample size of the study and met the inclusion criteria for the study. All un-consenting females, all other radiologic diagnostic methods other than ultrasound scan and those below or above the required age were excluded from the study. Data Entry was accomplished using Microsoft Office Excel version 10 and Statistical Analysis using the Statistics Package for the Social Sciences (version 22.0). Numeric variables were represented by the arithmetic mean and standard deviation while descriptive variables were represented in frequencies and percentages. Data collected were presented in diagrams, tables, charts, and figures where appropriate.

3. Results

The data obtained in this study spanned three (3) months period, from August to October 2019, on the anatomical location of uterine fibroids in University of Port Harcourt Teaching Hospital (UPTH). The data were presented as categorical variables described as frequency (%); presented in tables and figures. A total of 271 women who presented for ultrasound scan were included in the study and 92 were confirmed to present with uterine fibroid, thus giving prevalence of 33.9% for this study.

Table 1 Total number of women and percentage presence of tumour

Variable	Frequency	Percentage
Present	92	33.9
Absent	179	66.1
Total	271	100

In table 1, it shows the total amount of women who participated in the study (271) and divides it into those who had uterine fibroids (92) and those who did not have uterine fibroids present upon scan (179). This therefore revealed the point prevalence of 33.9% in the study time frame.

Table 2 Age group prevalence of uterine fibroid

Age (yrs.)	Frequency	Percentage
18-25	6	6.6
26-30	13	14.3
31-35	24	26.4
36-40	22	24.2
41-45	14	15.4
46-50	8	8.8
51-55	5	4.3
Total	92	100.0

In table 2 we have the age distribution of women who had uterine fibroids, it was observed that, those within the age range of 31-35 had the highest frequency of 26.4%, followed by those between 36- 40 with 24.2%.those with the lowest frequency were between the age range 51-55 years.

Table 3 Shows the distribution of parity

Parity	Frequency	Percentage
Null	93	34.3
P ₁	45	16.6
P ₂	26	9.6
P ₃	17	6.3
P ₄	14	5.1
P ₅	7	2.6
P ₇	1	0.4
P ₈	2	0.7
P ₉	2	0.7
G ₁₋₃ P ₀	49	18.2
PNID	15	5.5
Total	271	100

Table 4 Shows the percentage occurrence of uterine fibroids with parity

Tumor presence	Frequency	Percentage
Gravid	19	7
Parous	29	10
Nulliparity	44	16
Total	92	100

In table 4, women who are nulliparous have the highest percentage occurrence of uterine fibroids, those who did not indicate number of children had the lowest occurrence.

Table 5 Demonstrates number of tumour with respect to number of fibroids

Variable	Frequency	Percentage
Single	30	33.0
Multiple	62	67.0
Total	92	100.0

In table 5, frequency of women with multiple fibroids was seen to be (62) while those with single fibroid was (30).

Table 6 Distribution of types of fibroids

Variable	Frequency	Percentage
Submucosal	5	5.4
Intramural	57	61.9
Intramural and submucosal	17	18.5
Subserous	8	8.7
Cervical	2	2.2
Intracavitary	3	3.3
Total	92	100

In table 6, the type of uterine fibroids shows intramural as the highest occurrence followed by multiple uterine fibroids of both intramural and submucosal types.

Table 7 Anatomical Location of Tumour

Location	Frequency	Percentage
Anterior wall	39	42.3
Anterior and posterior wall	18	19.5
Antero-fundal wall	21	23.0
Postero-fundal wall	7	7.6
Posterior wall	7	7.6
Total	92	100.0

In table 7, the exact location of the uterine fibroid on the walls of the uterus shows the anterior wall with the highest frequency closely followed by the antero-fundal wall. Lowest frequency is the posterior and postero-fundal walls.

Table 8 Sonographic Approaches

Sonography	Frequency	Percentage
T. AB	137	50.6
OBST.	69	25.5
T.VS	13	4.8
PEL	52	19.2
Total	271	100

KEY: T. AB – Transabdominal Scan; OBST. – Obstetric Scan
T.VS – Transvaginal Scan; PEL – Pelvic scan

In table 8, different sonographic approaches employed with transabdominal scan being the highest frequency, followed by obstetric scan.

4. Discussion

The prevalence of uterine fibroids among females undergoing ultrasound scan was estimated to be 33.9% and this value is more than the 12.1% prevalence found in Northern Nigeria by Lawal et al. [16] this could be as a result in the increasing trend of uterine fibroid of diagnoses. This research is partly in agreement with the 10-year interval US population based study by Yu et al. [17] which showed the overall prevalence as of 2014 was 9.6%, and was highest among women aged 50-54 years (15.9%), black women had higher prevalence (18.5%) than other racial/ethnic groups, they concluded that their findings indicated a decreasing trend of new uterine fibroid diagnoses among predominantly symptomatic women ages 18-65 years but was disproportionately high and occurred at younger ages for black women. These findings are of concern, as current available long-term medical therapies remain limited. In an internet self-prevalence study on uterine fibroids carried out by Wise and Laughlin-Tommaso [18], of 21,746 women across 8 countries between the age range of 15-49 years except in US where due to legal reasons started from 18-49 years, it revealed that the prevalence ranged from 4.5% (UK) to 9.8% (Italy), reaching 9.4% (UK) to 17.8% (Italy) in the age group of 40-49 years. Their study submits that uterine fibroids are quite common among women in reproductive age, since most of their study population was made of women who had been previously diagnosed. 1.8% of women in this study while in their twenties already received the diagnosis of uterine fibroids. The mean average age of women diagnosed with uterine fibroid across the 8 countries ranged between 33.5 and 36.1 years. One of the conclusions their study drew was that age is a risk factor for uterine fibroid.

In this study, it was observed that uterine fibroid was higher among respondents within ages 31-35 years and 36-40 years old thus corresponding with Olotu et al. [8] and Lawal et al. [16] findings put at 51.9% (26-35 years) and 29.8% (36-40 years) respectively. The slight difference observed is probably because of the differences in age grouping, but this suggests that women in this century are more likely to be involved in building a career. Results in this study does not agree with the case study by Ernest, Nwakalebela and Mpondo [19] that concluded that there is a rise in incidence of uterine fibroids in adolescents, this is because early menarche, exposure to exogenous oestrogen and other factors like obesity usually influence fibroid growth.

The observable decrease in the occurrence of fibroid among respondents within ages 51-55 years likewise observed in Olotu et al. [8] age-based prevalence of uterine fibroid and Okon and Olotu [15], probably imply that the susceptibility to and chances of developing uterine fibroid decreases with increase in age, also it could be attributed to the onset of menopause and the reality that there is a reduction in the systemic circulation of oestrogen. The prevalence of clinically characteristic uterine fibroids crests in years just before menopause and declines drastically with the onset of menopause [20]. A large cohort study of California teachers discovered that among 1,790 women, over 30% of newly diagnosed uterine fibroids were between the ages of 45–49 years [21]. Due to this phenomenon, the most acceptable practice is that when women are diagnosed with uterine fibroid at ages close to menopause, especially if they are asymptomatic or experience mild symptoms, the best course of action is to wait for menopause. This suggests that menopause regresses uterine fibroids because uterine fibroids depend on oestrogen and progesterone and since in menopause these hormones are scarce, uterine fibroids are starved of what appears to be their growth [22]. Uterine fibroid growth is double in women below the age of 35 years and is consistent with what this study reports, when compared with women greater than 35 years [23]. Some other study report that even after the age of 35 especially in Africans the growth rate still increases [24]. While other studies suggest that menopause only relieves the symptoms of uterine fibroid, it does not prevent its occurrence [21].

From the study population, 7% were pregnant with co-existing fibroid which is relatively higher than the 4.8% [16]. 8% of the affected respondents were parous with at least one child, while 16% were nulliparous which is in line with the work done by Okon and Olotu, [15]. Parity has been inversely associated with a risk of fibroid development in earlier studies, [25-27]. Although a direct protective effect of pregnancy has been demonstrated, little is known of the mechanism. There have been some suggestions that during postpartum uterine remodelling, there could be selective apoptosis of small lesions [25]. An intense systematic review of the consequence of fibroids on reproductive outcomes showed that uterine fibroids upsurge the risks of malpresentations- (odds ratio (OR) 2.9; 95% confidence interval (CI) 2.6-3.2), caesarean section- (OR, 3.7; 95% CI, 3.5-3.9), preterm delivery- (OR, 1.5; 95% CI, 1.3-1.7), and spontaneous miscarriage- (OR, 1.6; 95% CI, 1.3-2.0) [28]. The location of uterine fibroids are significant as far as unpleasant pregnancy results are concerned. It has been found that uterine fibroids adjacent to the placental site relate to contrary pregnancy outcomes like increased risks for bleeding, abruption, and premature rupture of membranes [29-30]. A study carried out to analyse the consequence of uterine fibroids in subjects who have experienced repeated pregnancy loss revealed that re-sectioning of uterine fibroids altering the cavity leads to nearly doubling of live-birth rates [23.3 to 52.0% ($p < 0.05$)], whereas women with uterine fibroids not distorting the uterine cavity can achieve high live-birth rates without intervention [31].

In a study in 2006, of 181 subjects who had all been suffering from uterine fibroids for at least a year with some ranging up to 5 years, 52 had submucosal fibroids, 45 had intramural fibroids 11 had subserosal fibroids while 42 had a mix of submucosal–intramural and 31 patients had a mix of intramural–subserosal fibroids. Some of the women were subjected to surgical treatment while others were not. Those who were had better chances at pregnancy especially those who had submucosal fibroids and underwent surgery. Women suffering from SS fibroids were not treated because there was little indication to surgery. They concluded that pregnancy rate can be affected by the location of uterine fibroid and say that especially if the uterine fibroid was submucosal, it had a higher rate of resulting in infertility, while subserous uterine fibroid was the least to impact pregnancy [32].

Submucosal, Intramural, and mixed submucosal-intramural fibroids are said to be of the most impact in uterine cavity alteration and therefore affecting the implantation of blastocyst on the uterine walls [33]. Consequently, the anatomical position of a fibroid is extremely pertinent in terms of its influence on fertility status, pregnancy achievement and pregnancy maintenance. In order of increasing importance, we have subserosal, intramural and submucosal. Most women who have been found to have submucosal fibroids, after they either underwent surgery or other forms of treatment had an improved chance at elimination of infertility and attainment of pregnancy [34]. This work certainly agrees with the report of this study as women responded that those with certain locations of uterine fibroids found it difficult to reach pregnancy.

Ultrasonography using the transabdominal and transvaginal routes has been employed most frequently, due to its accessibility and relatively low cost [35]. Even though Transvaginal scans are more sensitive for the diagnosis of small fibroids, the frequency of obstetric scan was higher. A bulky or retroverted uterus may lie outside the line of view for a transvaginal scan hence the need to employ several techniques to obtain the best diagnosis [36]. Ultrasonography in skilled hands can detect fibroids as small as 5 mm as they cause an alteration of the normal uterine contour. Submucous fibroids are usually clearly visible separate from the endometrium under transvaginal ultrasound [37]. Majority of publications show that ultrasound for the detection of uterine fibroids is extremely sensitive (90-100%) and that it also has good specificity (87-98%), positive predictive value (81-93%), and negative predictive value (98-100%) [38-39]. The use of USG has proven to be as efficient as magnetic resonance imaging (MRI) in fibroid detection and essentially as good for assessing their size and location especially if the uterus has less than five lesions [39]. Conversely, it is only when the number of lesions is high that MRI exceeds ultrasound's technical limitation in precise fibroid mapping and characterization [3].

5. Conclusion

The point prevalence of uterine fibroid as observed in this study (33.9%) is relatively high. More women in the age group 31 to 35 years presented with fibroids and the type and location of uterine fibroids was found to be intramural and anterior wall, respectively. This finding is helpful in providing data about the most likely type of uterine fibroid and its location in women as observed in the study. It is necessary that proper awareness of the condition is made known so that it can cause for early identification and possibly management.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article

Statement of ethical approval

Ethical clearance was obtained from the University Ethics Committee after scrutiny by the Departmental Ethics Committee, and the Ethics Committee of University of Port Harcourt Teaching Hospital. Confidentiality was ensured as personal information such as name and address of subjects were not used, however, to ensure records obtained were not mixed up, serial/record numbers were assigned to each file.

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