Anatomical Profile of Uterine Fibroids in Accra, Ghana: A Retrospective Review

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ABSTRACT

Uterine fibroids (UFs) cause various symptoms in women and may result in infertility or death. In Ghana, there is limited data on this condition. This study aimed to document the anatomical profile of histologically diagnosed UFs in a tertiary facility in Accra, Ghana. A retrospective review of all UF cases examined at the Histopathology Department of the 37 Military Hospital from 2015 to 2019 was conducted. Demographic and anatomical data were extracted. Eight hundred and fifty-five (855) UF cases were recorded, representing 31.1% of the cases (N=2748) submitted to the Department within this period. The mean age at diagnosis was 40.66 ± 8.85 years. There was a preponderance of multinodular fibroids (N=769). Women with multinodular fibroids were significantly older than those with single fibroid nodules. Intramural fibroids were the most recorded UF subtype (69.1%). The majority of UF cases in Accra are multinodular and/or intramural. Women of reproductive ages remain the most at-risk group. A healthy lifestyle and frequent routine check-ups should be encouraged to facilitate early detection and treatment.

Keywords: uterine fibroids, leiomyoma, intramural, multinodular, Ghana

Introduction

Uterine fibroids (UFs), also known as uterine leiomyomas or fibroids, are benign neoplasms of the uterine smooth muscle cells (Zimmermann *et al.*, 2012). They occur in 20-40% of women during their reproductive years (Sarkodie, Botwe, & Ofori, 2016), and by the onset of menopause affect about 70% of women (Stewart *et al.*, 2017); with less than 0.1% of cases progressing to malignancy (Levy *et al.*, 2000). In 2005, UFs accounted for about 10% of admissions to the gynaecological ward and 40% of major gynaecological surgeries at the Korle-Bu Teaching Hospital in Ghana (Ofori *et al.*, 2012; Seffah & Adanu, 2005). In 2012, 24.5% of Ghanaian women were found to have UFs (Ofori *et al.*, 2012).

UFs are asymptomatic in two-thirds of affected women (Sarkodie, Botwe, & Ofori, 2016), and may only be discovered incidentally on routine pelvic examination (de la Cruz & Buchanan, 2017). In symptomatic cases, they may cause a range of symptoms including menorrhagia, pelvic pain, pelvic pressure, bladder or bowel dysfunction and constipation (Sarkodie, Botwe, Adjei, *et al.*, 2016; Stewart *et al.*, 2017). These symptoms negatively impact women's lives; influencing their sex lives, performance at work and their relationship with their families (Zimmermann *et al.*, 2012). Although most women with UFs will have uncomplicated pregnancies, some experience adverse fertility and pregnancy outcomes such as pain, preterm labour, placental abruption, and postpartum haemorrhage. Such women may also be at increased risk of caesarean section (Cook *et al.*, 2010).

UFs are classified according to their anatomical location in the uterus as cervical (arising from the uterine cervix) or corporal (arising from the uterine corpus) (Shahida *et al.*, 2017). Relative to the layers of the uterus, corporal fibroids are further classified as submucosal, intramural or subserosal. These fibroids interfere with fertility in decreasing order of importance (de la Cruz & Buchanan, 2017; Somigliana *et al.*, 2007). Apart from the location in the uterus, fibroids can be classified by their number as singular (uni-nodular) or multiple (multi-nodular) (Khan *et al.*, 2014).

Despite in-depth research, the exact aetiology of UFs remains elusive. Their origin and pathogenesis have been attributed to a combination of genetic, hormonal and environmental factors (Shahida *et al.*, 2017). Women at greatest risk are women of African-American descent, women with familial history of fibroids and women of reproductive ages (Opare-Addo *et al.*, 2014; Shahida *et al.*, 2017). Furthermore, obesity, nulliparity, young age at menarche, and heavy intake of alcohol have been found to significantly increase UF risk (Faerstein *et al.*, 2001; Wise *et al.*, 2004). Protective factors are prolonged menstrual cycles, prolonged use of oral contraceptives, late age at first birth, breastfeeding, vegetarian food and smoking (Bizjak *et al.*, 2016; Shahida *et al.*, 2017).

In Ghana, little attention has been paid to UFs. Data on its prevalence is limited, and reliable population-based research is lacking. Importantly, data on the anatomy of UFs is almost non-existent. With the gradual changes in the lifestyle patterns of humans, the possibility of alterations in the pathobiology of diseases cannot be ruled out. It is, therefore, crucial to document the anatomical features of UFs in Ghana, which will serve as a basis for comparison for future observations, to determine any appreciable variations.

Methods

Study Design/Setting

We employed a retrospective study design covering all UF cases reported from 2015 to 2019 at the Histopathology Department of the 37 Military Hospital – a tertiary health facility in the Greater Accra Region of Ghana. The 37 Military Hospital is a 600-bed facility that provides various healthcare services, including ultrasonography and histopathology services. The Histopathology Department – within the J. M. Wadhwani Department of Anatomical Pathology of the hospital – records an average turnover of 26 surgical pathology cases weekly.

Data Collection

Patient clinical reports were retrieved from the archives of the Histopathology Department of the hospital. Demographic and anatomical data were extracted, covering all cases from 2015 to 2019. Variables collected include age at diagnosis, nodularity and classification of fibroids.

Ethical Approval

This study was approved by the 37 Military Hospital Institutional Review Board (37MH-IRB), Neghelli Barracks (37MH-IRB IPN/NFP/395/2020).

Statistical Analysis

All data were entered in Excel 2016 and analysed using IBM SPSS v22.0. Categorical variables were presented as frequency (percent), and continuous variables as mean ± SD. A Shapiro-Wilk test was used to determine the normality of age distribution. A Mann-Whitney-U test was used to test the association of age to nodularity of fibroids. Variables with p values <0.05 were considered statistically significant.

Results

A total of 4332 surgical pathology cases were recorded at the Department in the reviewed period. Majority (2748/63.4%) of them were females out of which, 855 (31.1%), 2 (0.1%) and 1891 (68.8%) were UF cases, leiomyosarcoma cases and others respectively (Figure 1).

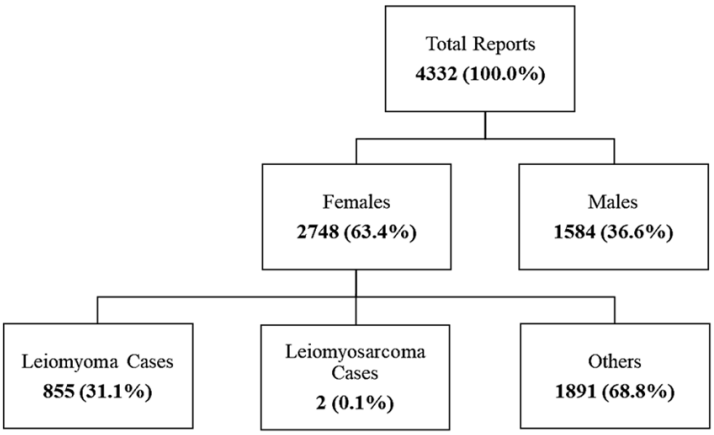

Fig. 1: Flowchart showing the number and types of surgical pathology cases recorded.

The mean age at diagnosis was 40.66 ± 8.85 years. Women of ages 31 to 50 were the predominant group, accounting for 80.1% of total cases. Additionally, 10.1% of the women presented with uninodular fibroids whereas 89.9% presented with multinodular fibroids (Table 1). The median age of women with uninodular fibroids [37 years] and multinodular fibroids [40 years] varied significantly (p=0.006).

Table 1: Age distribution and nodularity of UFs

Variable	Frequency (n = 855)	Percent (%)
Age (years)	40.66 ± 8.85*	
≤20	2	0.20
21 to 30	87	10.20
31 to 40	353	41.30
41 to 50	332	38.80
51 to 60	52	6.10
61 to 70	22	2.60
≥71	7	0.80
Nodularity		
Uninodular	86	10.10
Multinodular	769	89.90

*: Presented as mean ± SD

Figures 2a and 2b describe the types and subtypes of UFs observed. Majority (732/86%) of the cases were unspecified (Figure 2a). Of the specified cases, two were of cervical origin and one hundred and twenty-one were of corporal origin. Four of the corporal fibroids were not classified into any subtypes. Forty-one of the women had submucosal fibroids, eighty-five had intramural fibroids, and thirty-two had subserosal fibroids. Thirteen women had all three subtypes (Figure 2b).

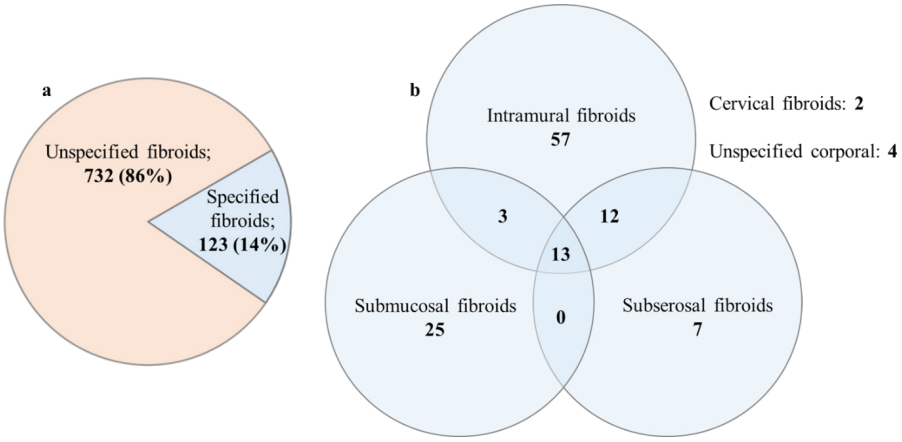

Fig. 2: Classification of UFs. (a) Specification of UFs. (b) Types and subtypes of specified cases.

Table 2 presents the frequency of UF subtype stratified by nodularity. Among the multinodular cases, intramural fibroids were predominant, followed by submucous and subserous fibroids. Intramural and submucous fibroids were the major subtype of uninodular fibroids.

Table 2: Subtypes of specified cases stratified by nodularity

Subtype	Nodularity	
	Uninodular	Multinodular
Cervical	1	1
Submucous	9	32
Intramural	9	76
Subserous	1	31

Discussion

The present study describes the anatomical features of UFs diagnosed in a tertiary facility over 5 years. Of the 855 reviewed cases, 10.4% were <31 years, 80.1% were 31-50 years and 9.5% were >50 years of age. This is in harmony with findings that UF risk increases with age until the fifth decade and decreases afterwards (Lurie *et al.,* 2005). A similar study in south-southern Nigeria demonstrated that 96.5% of women with UFs were between 26 and 45 years (Olotu *et al.,* 2008). Flake *et al.,* posited that the observed age prevalence of fibroid

development could result from increased growth of, or increased symptomatology, from already existing fibroids, or from a greater willingness of women to seek frequent health check-ups in the later reproductive years. Furthermore, it may be due to the effect of reproductive hormones or a reflection of the cumulative culmination of 20 to 30 years of stimulation by these hormones (Flake *et al.*, 2003).

In assessing the anatomical features of UFs, we found that majority (89.9%) of the cases were multinodular. Moreover, women with multinodular fibroids were significantly older than women with uninodular fibroids, suggesting that nodularity of UFs is age-dependent. This observation may be ascribed to increased exposure to steroid hormones – especially oestrogen – in older women than in younger women, leading to a higher risk of developing multiple fibroid nodules. Although majority of the UF cases were unspecified in the clinical reports, 57 (46.3%) of the specified cases were solely intramural. This corroborates the findings of Ofori *et al.*, which indicated that 44% of UFs in Ghanaian women are intramural (Ofori *et al.*, 2012). UFs are due to abnormal proliferation of uterine smooth muscle cells, and intramural fibroids develop within the myometrium (de la Cruz & Buchanan, 2017) with no mucosal or serousal distortion (Laughlin *et al.*, 2009). With respect to layers of the uterus, it follows that intramural fibroids will be more common compared to the others. We recorded higher submucosal fibroids (20.3%) and lower cervical fibroids (1.6%) compared to previous studies (5.6% and 4.9% respectively) (Ofori *et al.*, 2012). This may be due to changes in the pathobiology of UFs over time, leading to the development of more intra-corporal fibroids.

The anatomical location, nodularity and size of UFs contribute to their symptomatology. Ciavattini *et al.*, found that women with multinodular fibroids have significantly higher rates of preterm birth, breech presentation and caesarean section compared to women with uninodular fibroids (Ciavattini *et al.*, 2015). Regards to location, submucosal fibroids are the greatest cause of unfavourable reproductive outcomes because of their proximity to, and distortion of the endometrial lining (Horne & Critchley, 2007; Ofori *et al.*, 2012). Women with submucosal UFs have lower clinical pregnancy and implantation rates, as the fibroids may disrupt normal rhythmic uterine peristaltic movements and contractility, or obstruct the tubal ostia, impeding sperm arrival at the oviducts and embryo movement into the uterus (Horne & Critchley, 2007; Klatsky et al., 2008; Pritts *et al.*, 2009). Implantation is especially affected when the fibroid lesions occur at the superior posterior wall of the womb, the usual site for implantation. Submucosal UFs also pose a greater risk of spontaneous abortion, preterm birth and miscarriage secondary to abnormally increased uterine contractions (Cook *et al.*, 2010; McWilliams & Chennathukuzhi, 2017). In addition, submucosal UFs may cause menorrhagia (McWilliams & Chennathukuzhi, 2017) with resultant iron deficiency anaemia. Large submucosal fibroids can also put pressure on adjacent organs, resulting in pain, urinary symptoms, and constipation (Gambadauro, 2012; Stewart, 2001).

Intramural fibroids, though they may not cause uterine cavity distortion, negatively affect pregnancy and implantation rates (Pritts *et al.*, 2009; Stovall *et al.*, 1998). They distort the normal architecture of the myometrium, which affects the adequacy and synchrony of uterine contractions necessary for childbirth (Zagami *et al.*, 2015). They also increase the risk of postpartum haemorrhage (Zhao *et al.*, 2017), probably due to their effect on synchronous uterine contractions necessary for haemostasis after childbirth. Subserosal fibroids have no detrimental outcomes on fertility (Stovall *et al.*, 1998). However, large subserosal fibroids may put on surrounding pelvic organs or cause urinary obstructive symptoms which could complicate into toxic necrosis of the kidneys. Cervical fibroids can impede cervical dilation during delivery; an indication for operative term delivery via caesarean section (Tigdi & Chan, 2019).

From this study, 89.4% of the specific cases were submucosal and/or intramural, suggesting that majority of fibroid-affected Ghanaian women experience adverse gynaecologic, obstetric and fertility outcomes. Nonetheless, submucosal and intramural UFs cause the most severe symptoms and usually warrant

invasive surgical procedures such as hysterectomy and myomectomy. This could explain the high percentage of such cases we observed. Besides, majority of the UFs were unspecified, rendering our speculations possibly biased. We attribute these inconsistencies to the fact that, usually in many health facilities, the details of surgery are recorded in operations notes by a surgeon/gynaecologist. Unfortunately, the histopathology forms are filled by operation assistants and sometimes house officers who were not present at the surgery. This leads to inexact data being recorded in the histopathology forms. We recommend that documentation of cases at surgery should be as detailed as possible. Additionally, comprehensive surgical reports should be made available to histopathology departments. This will facilitate surveillance of the anatomical features of UFs in Accra and the nation as a whole, to detect any significant variations in the future. Surveillance studies to monitor fibroid characteristics in Ghanaian women are highly recommended. Further research is needed to understand the determinants of fibroid nodularity, location, and symptomatology among Ghanaian women.

Although this paper provides reference data for future comparison, some limitations have to be acknowledged. Firstly, the data was obtained from a single tertiary facility. Thus, the spectrum of cases encountered may be subject to referral bias, with a tendency to see more severe or more complex gynaecological cases. Also, there was incomplete data on the types and sub-types of cases, rendering our speculations possibly biased.

Conclusion

Our study highlights the anatomical profile of UFs, which will be a basis for comparison to determine any future variations. Women of reproductive ages remain the high-risk group, and most UF cases in Ghanaians are multinodular and/or intramural. We recommend large community-based studies, to assess the epidemiology of UFs among Ghanaian women.

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