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ULTRASOUND EVALUATION OF UTERINE FIBROIDS AMONG WOMEN OF CHILD BEARING AGE: A SINGLE CENTRE STUDY IN PORT HARCOURT METROPOLIS

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ABSTRACT

BACKGROUND: Uterine fibroid has been reported as the most common benign gynaecological tumour affecting women of childbearing age globally, with an estimate of 9 million cases being diagnosed in 2019 alone. Uterine fibroid is one of the major problems affecting women. Understanding the most common type of uterine fibroid, region of the uterus mostly affected and the most affected age group is essential.
OBJECTIVE: To evaluate the prevalence of uterine fibroid in Port Harcourt Metropolis using ultrasound scan.
METHODS: The study conveniently assessed a total of 1575 women aged from 18 to 55 years referred for pelvis/abdominopelvis ultrasound scan in a selected healthcare facility/radio-diagnostic centre in Port Harcourt, Nigeria from October, 2023 to March, 2024. The study adopted a prospective descriptive research design using a Mindray DP-2200 with a 3.5MHz transducer. Each patient was made to lie down on a couch and a generous amount of ultrasound gel applied on the lower abdomen. The 3.5MHz transducer was used to scan after which, sections of the pelvis indicating uterine fibroid imaged. The uterus was visualized as a pear-shaped anteverted structure superior to the vagina and posterior to the urinary bladder and having different echogenicity according to the phase of the menstrual cycle while the uterine fibroids were identified ultrasonically as distinct ovoid echopenic nodular masses. The type, site/location of the uterine fibroid including age group distribution were data obtained from the scanned women following ethical approval with their consent sought. Analysis was done using the statistical package for social science Inc, Chicago, IL, USA, version 26.0.
RESULTS: The most common type of uterine fibroid observed was the intramural, accounting for 61.9% cases while submucosal fibroids (5.4%) and the pedunculated type of myoma (4.0%), revealed a comparatively lower occurrence within the population under study. The exact location of the uterine fibroid on the walls of the uterus showed the anterior wall with the highest frequency closely followed by the antero-fundal wall while the lowest frequency was observed in the posterior and postero-fundal walls. Age group distribution showed that women 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.
Conclusion: Ultrasound evaluation demonstrates intramural type of fibroids located mostly in the anterior wall of the uterus, prevalent in women of age group 31 to 35 years in the studied population. Thus, the role of ultrasound in the diagnosis of uterine fibroids cannot be overemphasized.

KEYWORDS: Port Harcourt; Uterus; Ultrasonography; Uterine fibroid;

INTRODUCTION

The sudden upsurge in the population of women of reproductive age developing uterine fibroids globally within the last two decades has been quite alarming, with an estimate of 9 million cases being diagnosed in 2019 alone (Dai *et al*., 2024). Globally, uterine fibroid has been reported as the most common benign gynaecological tumour affecting women of childbearing age (Stewart *et al*., 2017).

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In Nigeria, fibroid accounts for 3.2 to 7.8% of gynaecological cases generally and 68.1% of hysterectomy cases (Aboyeji & Ijaiya, 2002).

In recent years, the prevalence of uterine fibroids among women of childbearing age has proven to be on the rise. This generalized and markedly debilitating gynaecological condition is associated with myriad of symptoms that significantly erode the quality of life. These symptoms can range in severity from mild to severe, and some of the more prevalent ones are pelvic discomfort, heavy menstrual flow, and organ pressure. Thus, the effects are extensive and have many facets (Guo & Segars, 2012).

Uterine fibroids, medically called leiomyoma uteri or myoma, are benign (non-cancerous) tumours of the smooth muscles of the uterus. It is defined as a non-cancerous growth that can either be symptomatic or asymptomatic and is found in the uterine muscle layers in women who are reproductive (Barjon & Mikhail, 2023). Fibroid-derived cancer rarely develops with the American College of Obstetricians and Gynecologists (ACOG) estimating that there is less than a one in a thousand chance that a fibroid will develop into cancer (Sabry & Al-Hendy, 2012). Depending on the part of the uterus that is affected, there are different types of uterine fibroid; intramural, subserousal, submucosal, cervical, and pedunculated fibroid (Guo & Segars, 2012). Women and individuals have different uterine fibroids in composition, size, and number. Also, the fibroid pseudo-capsule is a fibro-neurovascular structure that surrounds a uterine fibroid and separates it from the normal peripheral myometrium (Tinelli *et al*., 2012).

Uterine fibroids, especially when small, can be completely asymptomatic. Some uterine fibroids, on the other hand, can cause problems with periods, continuous vaginal bleeding (menorrhagia, dysmenorrheal, and intermenstrual bleeding), noncyclic pelvic pains, pressure-related symptoms like feeling bloated, having to go to the bathroom a lot, having trouble getting pregnant, and problems during pregnancy (Uimari *et al*., 2022). Uterine fibroids are associated with infertility, abortion, premature labour, heavy bleeding, pelvic pressure, and severe cramping. Some of these symptoms may be severe and change the individual's healthy lifestyle (Laughlin *et al*., 2010).

Although benign, uterine fibroids are associated with significant morbidity; they are the primary indication for hysterectomy and a major source of gynaecologic and reproductive dysfunction (Stewart *et al*., 2017). Uterine fibroids represent a significant societal health and financial burden. Accordingly, the annual USA health care costs associated with uterine fibroids have been estimated at ~$34 billion (Yang *et al*., 2022). This high prevalence of uterine fibroids is associated with profound effect on global healthcare costs. According to estimates, uterine fibroid costs up to 34.4 billion dollars per year in the United States, 348 million in Germany, 120 million in France, and 86 million in England, surpassing the other two common cancers in women, breast cancer and ovarian cancer (Lou *et al*., 2023). Aside from the immediate medical costs, the yearly indirect costs brought about by time off work and disability caused by uterine fibroids are estimated to be between 1.6 and 17.2 billion dollars (Fuldeore *et al*., 2015). Infertility and other pregnancy difficulties are linked to uterine fibroids and can require treatment for a minimum of ten years, accounting for 4% to 23% of annual costs (Guo & Segars, 2012).

Ultrasonography is the first-line of investigation that reveals the number, size, and location of fibroids. Three-dimensional ultrasound can give valuable information about relationship of fibroids with endometrial cavity (Somigliana *et al*., 2007). Uterine fibroids are often underreported and misdiagnosed probably due to their asymptomatic nature or symptoms mimicking other gynaecological conditions. This leads to delay in diagnosis, inappropriate management, and potential long-term health consequences to the affected individuals (Al-Hendy *et al*., 2017). However, there are several challenges in understanding the epidemiology of uterine fibroids globally, for example, most women with uterine fibroids are asymptomatic and the uterine fibroids are discovered by accident during a routine gynaecologic examination or procedures (Tseng *et al*., 2019). The large number of undetected uterine fibroids creates a significant bias in epidemiological data. Also, only very few studies have explored the incidence or prevalence of uterine fibroids to date. Given the considerable impact on physical, social and public health, understanding global variations in the burden of uterine fibroids is pivotal. It can be used to identify factors contributing to these variations, and to make decisions regarding the allocation of resources for disease screening and management. The study sought to document the most common type of uterine fibroid, to determine the region of the uterus mostly affected and to assess the most affected age group. As a consequence, data obtained from the present study will help in creating awareness on early detection, diagnosis and the management of uterine fibroid in the study location.

MATERIALS AND METHOD

This was a prospective descriptive study conducted among female patients seen at the Ultrasound Unit of Ranez Medical Consultants Hospital, Port Harcourt in Rivers State, Nigeria, for routine gynaecologic and obstetric evaluations from October 2023 to March 2024. The subjects in this study were asymptomatic women of childbearing age that ranged from 18-55 years, comprising a sample size of 1,575 female patients examined at the Radiology Department for pelvic ultrasound scans.

Scanning was made with a Mindray DP-2200 ultrasound machine and a 3.5MHz transducer. All scanning procedures were performed with the patient supine on a couch with a coating of ultrasound gel to the lower abdomen for optimal imaging. The transducer was used to examine the gynaecological region, particularly the pelvic area, to identify uterine fibroids. The uterus was visualized as a pear-shaped, anteverted structure located superior to the vagina and posterior to the urinary bladder with its echogenicity dependent on the phase of the menstrual cycle. Uterine fibroids manifested as well-defined, ovoid, echogenic, nodular masses. In this study, information was gathered from every patient on their age, uterine anteroposterior diameter, myoma type, myoma location, myoma size, and number of myomas. Analysis was conducted with the statistical package for social sciences (SPSS) version 26.0 by IBM Corporation, Chicago, Illinois, USA. The institutional ethics committee of the Ranez Medical Consultants Hospital approved this study. The patients' data were kept strictly confidential and used only for the purpose of the study. The level of significance was set at p = 0.05.

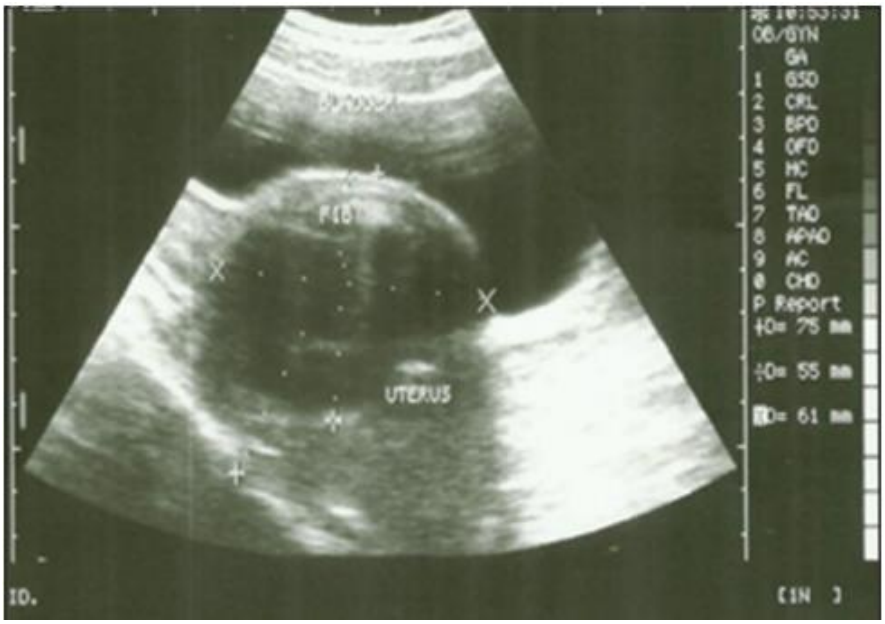

Figure 1: Longitudinal ultrasound scan showing the bladder, uterus, and fibroid. The fibroid identified as an oval echopenic mass

RESULTS

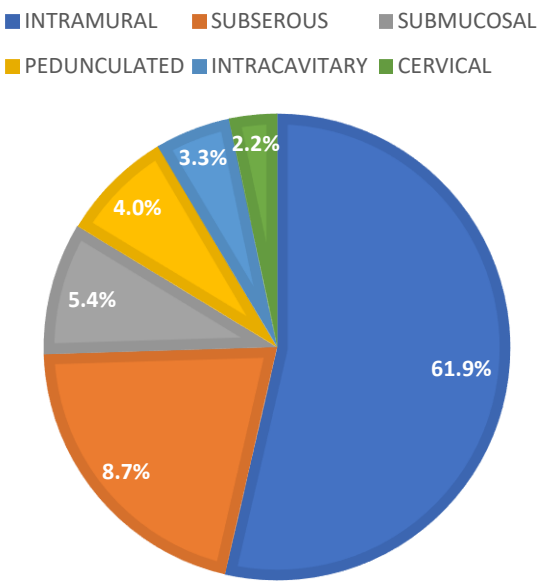

Figure 2: Types of fibroids

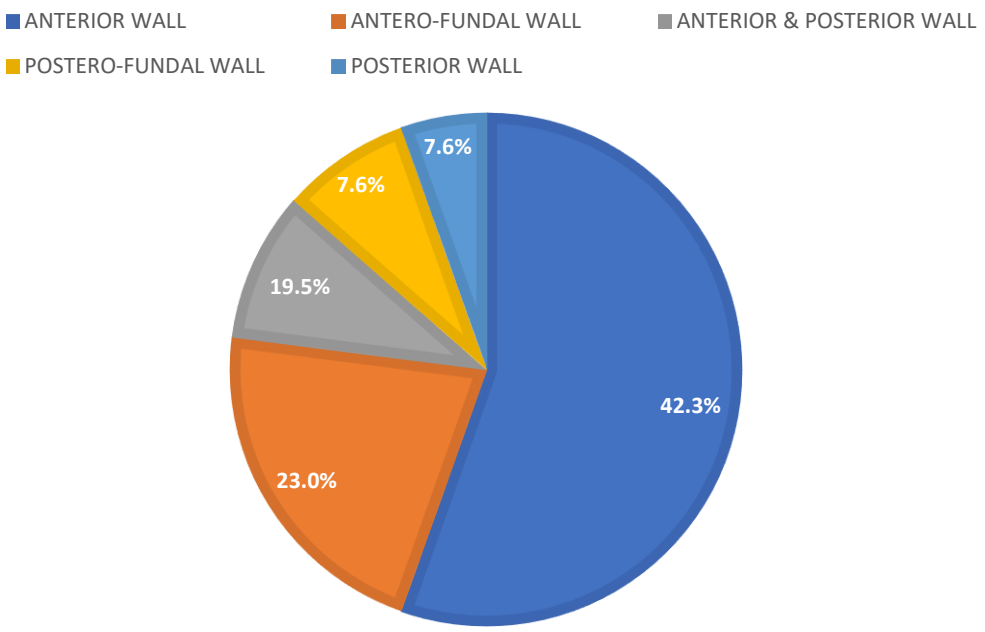

Figure 3: Anatomical location of the fibroid (region mostly affected by the fibroid)

In figure 3, 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 while the lowest frequency is observed in the posterior and postero-fundal walls.

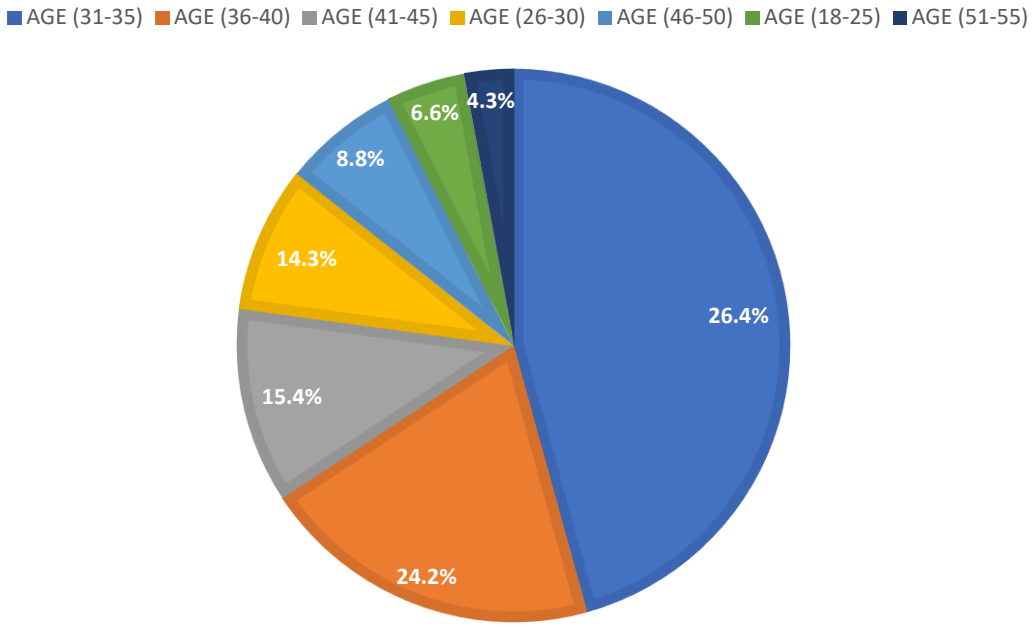

Figure 4: Age group prevalence of uterine fibroids

In figure 4, 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 age range 51-55 years

DISCUSSION

Estimating the overall prevalence of fibroids in a population depends on the population under investigation including the sensitivity and specificity of the methods applied in the detection. The present study captures/focused on uterine fibroids with the use of ultrasound as the imaging modality of choice. Upon evaluation, the most common type of uterine fibroid observed was the intramural, accounting for a significant majority of 61.9% cases of the total sampled population (figure 2). This suggest that fibroids primarily develop within the muscular wall of the uterus, which is consistent with existing literature which also indicates that intramural fibroids are among the most prevalent types. Submucosal fibroids (5.4%) and the pedunculated type of myoma (4.0%), revealed a comparatively lower occurrence within the population under study. Similar works were also reported but did not account for the pedunculated type of myoma which the present study noted (Akinyemi *et al*., 2004; Ezeama *et al*., 2012). The implication of this finding with regards to the etiopathogenesis of fibroids is that fibroids start intramuscularly within the myometrium before migrating. This is supported by a study that described the endomyometrial junction, with the aid of magnetic resonance imaging, as the interface between cyclic endometrium and the myometrium and a possible site of origin of submucosal and intramural fibroids (Tocci *et al*., 2008).

The distribution of fibroids across different anatomical locations within the uterus revealed interesting patterns (figure 3) with the anterior wall noted as the most common site/location of fibroid (42.3%). This is followed closely by the antero-fundal wall (23.0%). By implication, result of the present study suggests that fibroids tend to develop more frequently in the anterior region of the uterus, potentially impacting various aspects of reproductive health and fertility. Conversely, the posterior and postero-fundal walls exhibit the lowest frequencies, indicating a lesser occurrence in these areas. Consequently, the anatomical position of a fibroid is extremely pertinent in terms of its influence on fertility status, pregnancy achievement and pregnancy maintenance.

Age group prevalence, highlights a notable trend regarding the age distribution of women diagnosed with uterine fibroids (figure 4). The peak prevalence occurred in age range 31-35 years, comprising 26.4% of the studied population. This finding aligns with existing research (Olotu *et al*., 2008; Lawal *et al*., 2019) indicating that fibroids are most commonly diagnosed during a woman's reproductive years. The prevalence gradually decreases in older age groups, with the lowest frequency observed in the 51-55 age range with 4.3% probably implying the susceptibility to and chances of developing uterine fibroid decreases with increase in age.

Also, the observable decrease in the occurrence of fibroid within ages 51-55 years may be attributed to the onset of menopause and the reality that there is a reduction in the systemic circulation of oestrogen (Okon & Olotu, 2020). However, results of the present study contradict similar works (Ernest *et al*., 2016) who inferred a rise in incidence of uterine fibroids in adolescents probably due to early menarche, exposure to exogenous oestrogen and other factors like obesity which usually influence fibroid growth.

Ultrasonography using the transabdominal routes has been employed most frequently, due to its accessibility and relatively low cost (Levens *et al*., 2009). Ultrasonography in skilled hands can detect fibroids as small as 5 mm as they cause an alteration of the normal uterine contour. Also, studies showed that ultrasound in the evaluation/detection of uterine fibroids is extremely sensitive (90-100%) and that it also has good specificity (87-98%), positive predictive value (81-93%), and (Becker *et al*., 2002). Therefore, the significance of ultrasonography scan in the evaluation/diagnosis of uterine fibroids cannot be overemphasized.

CONCLUSION

Ultrasound evaluation demonstrates intramural type of fibroids located mostly in the anterior wall of the uterus, prevalent in women of age group 31 to 35 years in the studied population. Thus, the role of ultrasound in the diagnosis of uterine fibroids cannot be overemphasized. It therefore becomes necessary that proper awareness of the condition be encouraged for early diagnosis and detection with subsequent management and possible treatment.

CONFLICTS OF INTEREST: None declared.

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