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Clinical Presentation of Uterine Leiomyoma in Usmanu Danfodiyo University Teaching Hospital Sokoto (UDUTH), Nigeria: A 10 Year Review

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Abstract

Uterine leiomyoma is a benign tumour which is non-cancerous from smooth muscle tissue that develops from smooth muscle layer (myometrium) from the uterus. Uterine leiomyoma is the greatest of all leiomyoma affecting uterine smooth muscle as well as the greatest benign tumour for women. It is basically found at the period of middle as well as the late reproductive age. The rate of occurrence of uterine leiomyoma in the general population is not well understood. Evidences from clinical and epidemiological researches showed that the chances of uterine leiomyoma developing in Black women are higher compared to White women. A ten years retrospective study was conducted at the Histopathology Department, of Usmanu Danfodiyo University Teaching Hospital Sokoto (UDUTH), from 2003 to 2012. A review of case records of patients with a diagnosis of uterine leiomyoma was done. The data were analyzed and presented in tables using comparative percentages. The photomicrographs were snapped and presented. From the year 2010 the prevalence of uterine leiomyoma in UDUTH is increasing, 2011 has the highest percentage of uterine leiomyoma (17.19%) followed by 2012 (16.67%). The result of this study shows that women within the 30-39 years age group has the highest percentage of uterine leiomyoma (36.39%) followed by 40-49 (28.39%). From this result it shows that intramural uterine leiomyoma occurred more with (69.01%) followed by Submucosal (24.74%) among the variant uterine leiomyoma. Uterine leiomyomas are the commonest benign tumours in women, with a higher preponderance amongst Africans. Several etiological factors have been suggested, with subtle variations in clinical presentation being reported in different studies. This may constitute a determinant for the management measures undertaken. An effective awareness/screening, sensitisation of women to report early for assessment of such illnesses is

advocated. Also, training of staff to enable centres offer the newest techniques to the patients should be encouraged.

Keywords: Uterine leiomyoma, hysterectomy, leiomyosarcoma

Introduction

Uterine leiomyoma is a benign tumour which is non-cancerous from smooth muscle tissue that develops from smooth muscle layer (myometrium) from the uterus. They are usually multiple, in the case where the uterus have many leiomyomata to count, it is called diffuse uterine leiomyomatosis (Neiger *et al.*, 2006). The malignant type of leiomyosarcoma is extremely very rare. Leiomyomata is an uncommon pre-malignant tumour accounting for 0.1% (Holge *et al.*, 2007).

Uterine leiomyoma is the greatest of all leiomyoma affecting uterine smooth muscle as well as the greatest benign tumour for women, basically found at the period of middle as well as the late reproductive age (Strissel *et al.*, 2007).

Uterine leiomyoma are tumours which account for more than 200,000 hysterectomy as well as rapid growing myomectomies every year (Wilcox *et al.*, 1994 and Wilcox *et al.*, 1995). Nevertheless, the rate of occurring uterine leiomyoma in general population is not well understood.

Uterine leiomyoma are smooth muscles tumours in origin (Kempton and Hendrickson, 2000). These are tumours that are always found as multiple tumours in the same uterus (Kjerulff *et al.*, 1996), and each tumour is clonally distinct (Townsend *et al.*, 1970 and Hashimoto *et al.*, 1995). Notwithstanding that the cause of this tumour is not well known, but they

are hormonally dependent. These tumours are diagnosed only after menarche (Fields and Neinstein, 1996), and usually decline after menopause (Ross et al., 1986 and Cramer and Patel, 1990). These tumours shows some many sign and symptoms which include pregnancy complications, infertility, pelvic pain as well as excessive uterine bleeding that may result to anaemia (Carlson et al., 1994; Kjerulff et al., 1996 and Coronado et al., 2000)

Some literatures revealed prevalence of uterine leiomyoma of about 20% to 40% among women who are greater than 30 years of age (ACOG, 1994; Zaloudek and Norris, 1994; Fox and Wells 1995). Some studies also shows that Black women have been considered at higher risk of uterine leiomyoma tumours than White women in the world (ACOG, 1994), but the evidence is based on the clinical diagnosis. Having a hysterectomy due to uterine leiomyoma is more often in Black women (Meilahn 1989; Kjerulff et al., 1993; Wilcox et al., 1994 and Brett et al., 1997), also Black women in the Nurses' Health Study II reported high rates of new clinical diagnosis compared with White women (Marshall et al., 1997). It is not well understood whether these differences is as a result of extraneous factors that affect clinical diagnosis or to differences in the true incidence of the tumours.

Some studies show that lifelong risk for leiomyoma to occur is 70% in White women and 80% in Black women (Baird et al., 2003). The degree of the health care problem is observed by about 200,000 hysterectomies as a result of uterine leiomyoma in the United States each year (Varol et al., 2001). During the past two decades, some improvement has been made concerning studying the pathogenesis of this tumour from the clinical, genetic, epidemiological as well as molecular studies (Flake et al., 2003). A comparison was made by a large group of cohort study researchers

Evidences from clinical and epidemiological researches showed that the chances of uterine leiomyoma to develop in Black women are higher compared to White women (Kjerulff et al., 1996). Some evidences also show that there are higher incidence and greater morbidity with reflected in higher rates of hysterectomy in Black women affected with uterine leiomyoma (Wilcox et al., 1994). Genetic factor as well as environmental factors are some of the major factors that show the differences of uterine leiomyoma between White and Black women (Flake et al., 2003). Very few researches have investigated these factors among

ethnic groups. A comparison was made by a large cohort study on the incidence of uterine leiomyoma in four different ethnic group which include Hispanic, White American, Asian and Black women, the results shows that: (i) Black women were found with the highest incidence of uterine leiomyoma compared to other ethnic group; (ii) the result also shows that by considering age, body mass index, birth history, alcohol consumption as well as oral contraceptive use, these risk factors cannot explain the excessive rate of uterine leiomyoma among premenopausal Black women (Marshall et al., 1997). Studying and understanding the reason for such ethnic differences may help in identifying the aetiology as well as pathogenesis of uterine leiomyoma. Transcription profiling (Tsibris et al., 2002; Ahnet et al., 2003; Catherino et al., 2003; Chegini et al., 2003; Skubitz and Skubitz, 2003; Wang et al., 2003; Weston et al., 2003; Hoffman et al., 2004; Quade et al., 2004; Arslan et al., 2005) gives a very important molecular tool for determining dysregulated genes as well as their products in uterine leiomyoma.

Gynaecological tumours have recognised as an important health concern (Nkyekyer, 2000), particularly uterine leiomyoma which has been revealed to be the commonest benign –type tumour that arises in the muscular wall of the uterus (Ross et al., 1986; Vollenhoven 1998; Lower, 1999; Newbold et al., 2000), with incidence approximately 20% - 45% in age of women higher than 30 years (Akinyemi et al., 2004).

The aetiology of this tumour is unclear, epidemiological research revealed however, that uterine leiomyoma is related with a hormone-dependent benign tumour that is associated with the reproductive life cycle of a woman, increase in risk with age up until the fifth decade, and then reduces at the menopause age (; Cramer et al., 1995; Schwartz et al., 2000a,b). In fact, the development of this tumour is said to be controlled by ovarian steroids and growth factors (Okolo, 2008). Many factors were identified to be associated with this tumour from several studies which include age (Ross et al., 1986; Wilcox et al., 1994; Marshall et al., 1997), African-American ethnicity ethnicity (Lumbiganon et al., 1996; Kjerulff et al., 1996; Marshall et al., 1997; ; Faerstein et al., 2001; Day Baird et al., 2003;), obesity (Marshall et al., 1998; Sato et al., 1998; Okoronkwo, 1999;), diet (Chiaffarino et al., 1999), exposure to high radiation radiation (Wong et al., 1993; Kawamura et al., 1997), family history (Luoto et al., 2000; Schwartz et al., 2000a; Gross and Morton, 2001; Van Voorhis

et al., 2002; Sato et al., 2002), age at menarche as well as infertility (Cramer et al., 1995; Marshall et al., 1998; Sato et al., 2000; Faerstein et al., 2001). However, there are many evidences that show that uterine leiomyoma is very common among Black women than Caucasians (Oguniyi and Fasuba, 1990). Previous research shows that, the incidence rate of uterine leiomyoma in Nigeria ranges from 17.9-26% (Sagay et al., 1998; Vollenhoven et al., 1990) as against 11% in Europe as well as in United States (Ogedengbe, 2003). The incidence of uterine leiomyoma account for 3.2-7.8% of new gynaecological cases and 68.1% of hysterectomy cases in Nigeria (Otolorin et al., 1987; Aboyeji and Ijaiya, 2002).

Uterine leiomyoma is a very serious tumour affecting child bearing women that could lead to high mortality rate, therefore is major concern to public health, due to its poorly understood aetiology, as well asymptomatic. Also the nature of its prevalence among African people can bring a big challenge in identification and controlling it at its early stage. However the aim of our study is to evaluate the incidence and age distribution of uterine leiomyoma in women attending Usmanu Danfodiyo University Teaching Hospital Sokoto, Nigeria from 2003 to 2012.

Materials And Methods

Three hundred and eighty four (384) Paraffinised tissue blocks from Histopathology Department, Usmanu Danfodiyo University Teaching Hospital Sokoto, which is located in Sokoto, North Western Nigeria of West Africa were used for this research. This ten years (2003-2012) retrospective study was carried out at the Department of Histopathology, Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto. Tissue blocks were collected including bio data. Five microns thick sections were cut from the tissue blocks using the rotary microtome. The section was plodded in a water bath preheated at 45⁰c. They were dried on hot plate (Ochei et al., 2000). The sections were stained by haematoxylin and eosin staining technique. The section was mounted using DPX (Ochei et al., 2000) and viewed. Photomicrographs of the section were taken and the results were recorded.

A ten years retrospective study was conducted at the Histopathology Department, of Usmanu Danfodiyo University Teaching Hospital Sokoto (UDUTH), from 2003 to 2012. A review of case records of patients with a diagnosis of uterine leiomyoma was done. The data were analyzed and presented in tables using comparative percentages. The photomicrographs were snapped and presented. From the year 2010 the prevalence of uterine leiomyoma in UDUTH is increasing, 2011 has the highest percentage of uterine leiomyoma (17.19%) followed by 2012 (16.67%). The result of this study shows that women within the 30-39 years age group has the highest percentage of uterine leiomyoma (36.39%) followed by 40-49 (28.39%). From this result it shows that intramural uterine leiomyoma occurred more with (69.01%) followed by Submucosal (24.74%) among the variant uterine leiomyoma. Uterine leiomyomas are the commonest benign tumours in women, with a higher preponderance amongst Africans.

Results

In this ten years retrospective conducted at the Histopathology Department, of Usmanu Danfodiyo University Teaching Hospital Sokoto (UDUTH), from 2003 to 2012. From the year 2010 the prevalence of uterine leiomyoma was 17.19% in 2011 and 16.67% in 2012. Table 1 and 2 show the yearly distribution of uterine leiomyoma. The result of this study shows that women within the 30-39 years age group has the highest percentage of uterine leiomyoma (36.39%) followed by 40-49 (28.39%). Table 3 show the age distribution of uterine leiomyoma among the subjects. Most of the myomata were in many sites and on subcategorization of location indicated that the most common sites was intramural uterine leiomyoma occurred more with (69.01%) followed by Submucosal (24.74%) among the variant uterine leiomyoma. Uterine leiomyomas are the commonest benign tumours in women, with a higher preponderance amongst Africans as shown in table 4. Authors should include a brief information on the figures



YEAR	NO: OF SURGICAL BIOPSY	NO: OF UTERINE LEIOMYOMA
2003	980	4
2004	1015	54
2005	-	-
2006	935	40
2007	1038	32
2008	977	48
2009	984	18
2010	1180	58
2011	1699	66
2012	1587	64
TOTAL	10,397	384

TABLE 1: YEARLY DISTRIBUTION OF UTERINE LEIOMYOMA IN RELATION TO TOTAL SURGICAL BIOPSY

YEAR	NO: OF BIOPSY	NO:OF LEIOMYOMA	PERCENTAGE
2003	980	4	1.01%
2004	1015	54	14.06%
2005	-	-	-
2006	935	40	10.42%
2007	1038	32	8.33%
2008	977	48	12.5%
2009	984	18	4.69%
2010	1180	58	15.10%
2011	1699	66	17.19%
2012	1587	64	16.67%
TOTAL	10,397	384	100%

TABLE 2: PERCENTAGES OF YEARLY SURGICAL SAMPLES IN RELATION TO UTERINE LEIOMYOMA

YEARS	NO: OF UTERINE LEIOMYOMA	PERCENTAGE
0-9	1	0.26%
10-19	2	0.52%
20-29	92	23.96%
30-39	140	36.39%
40-49	109	28.39%
50-59	25	6.51%
60-69	6	1.56%
70-79	5	1.30%
80-89	4	1.04%
TOTAL	384	100%

TABLE 3: FREQUENCY DISTRIBUTION OF UTERINE LEIOMYOMA BIOPSY ACCORDING TO AGE GROUPS

VARIANT OF UTERINE MYOMA	TOTAL SAMPLES	FREQUENCY
SUBSEROVAL	24	6.25%
INTRAMURAL	265	69.01%
SUBMUCOSAL	95	24.74%
TOTAL	384	100%

TABLE 4: VARIANT OF UTERINE LEIOMYOMA FREQUENCY IN RELATION TO TOTAL UTERINE LEIOMYOMA SAMPLES

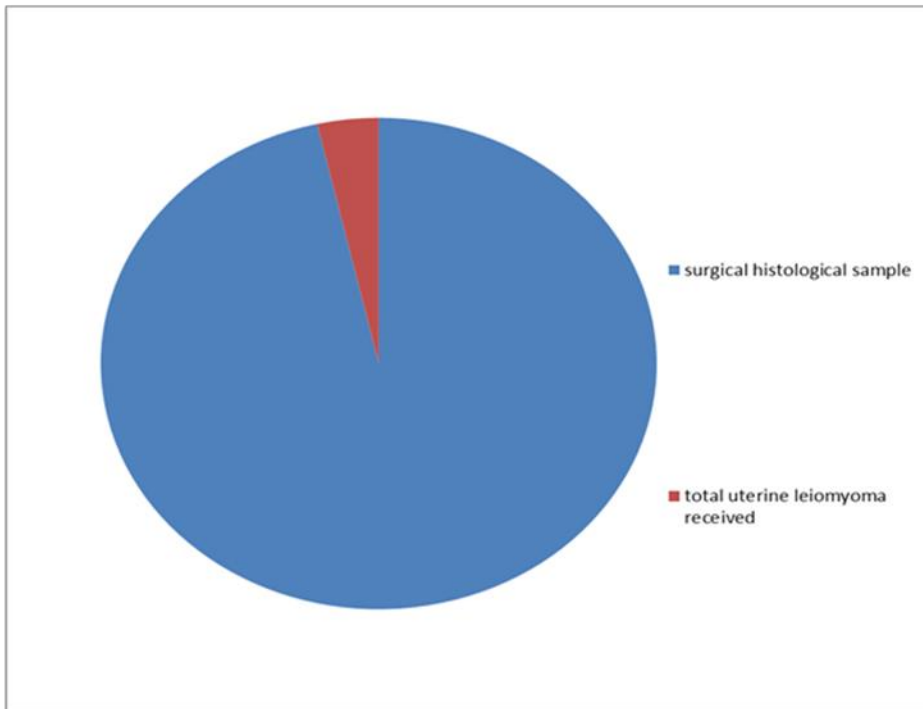


Figure 1: A pie chart showing the relationship between total surgical histopathological samples and uterine leiomyoma.

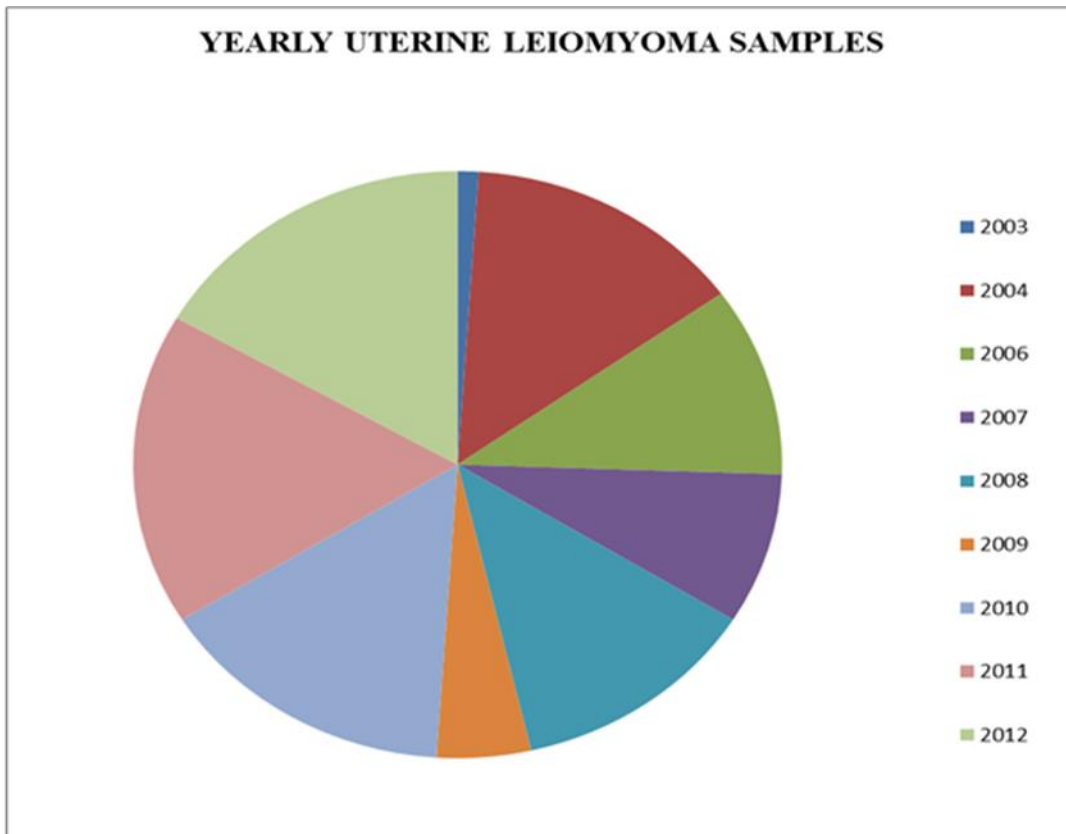


Figure 2: A Pie Chart showing the relationship between the total uterine samples received each year (2003-2012)

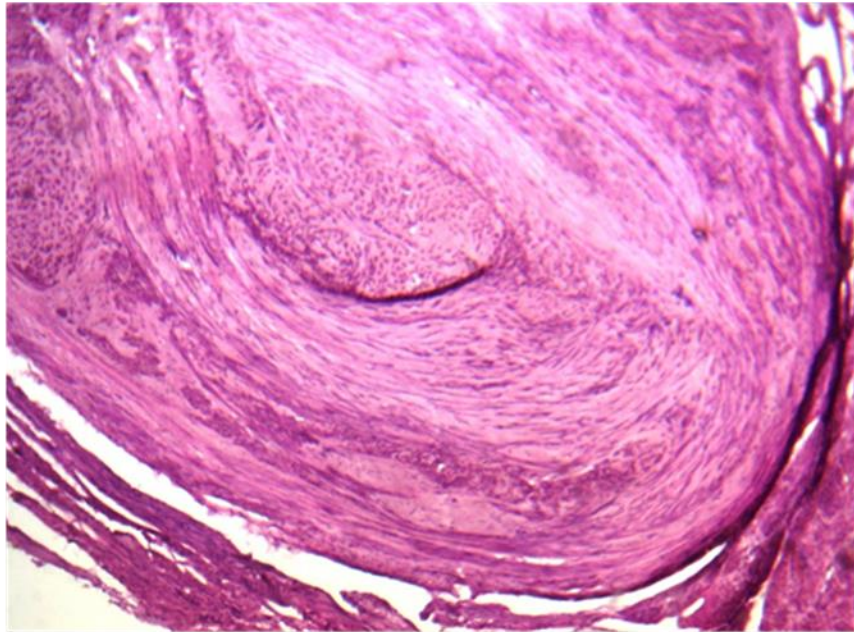


Figure 3: Histology of densely cellular fascicle of smooth muscle cell with minimal intervening collagen. H and E X 100

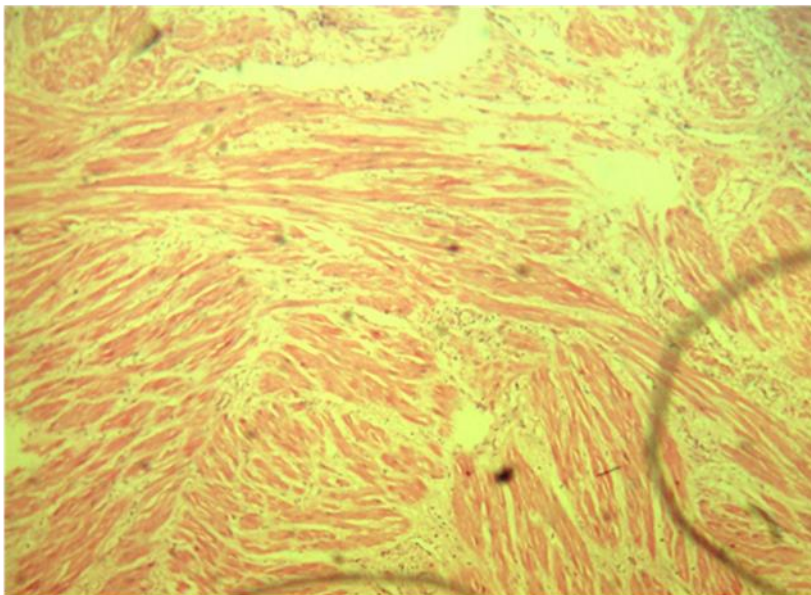


Figure 4: histology of densely cellular fascicle of smooth muscle with minimal intervening collagen. H and E. X 200

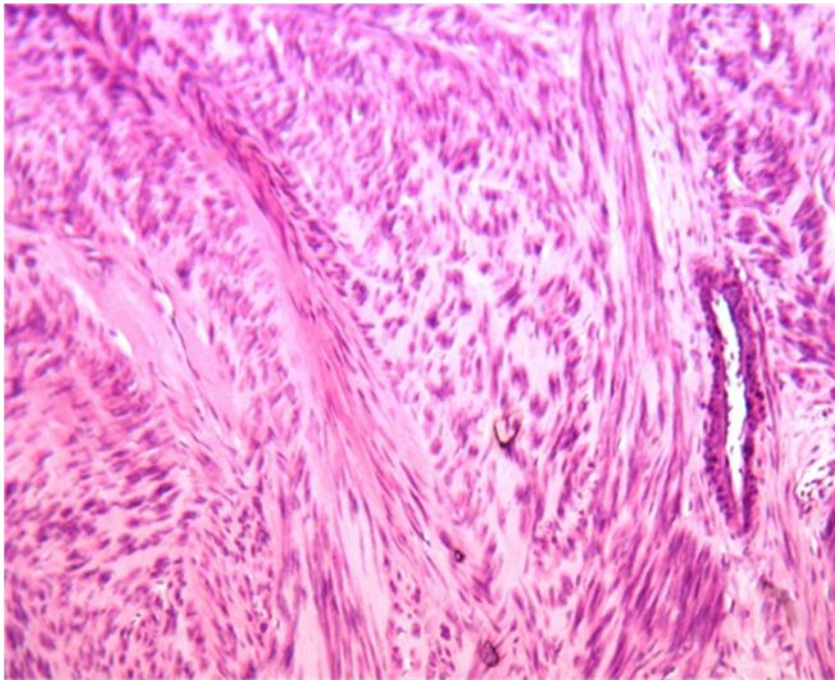


Figure 5: Histology of (Cellular Leiomyoma) Densely cellular fascicle of smooth muscle with minimal intervening collagen. H and E. X100

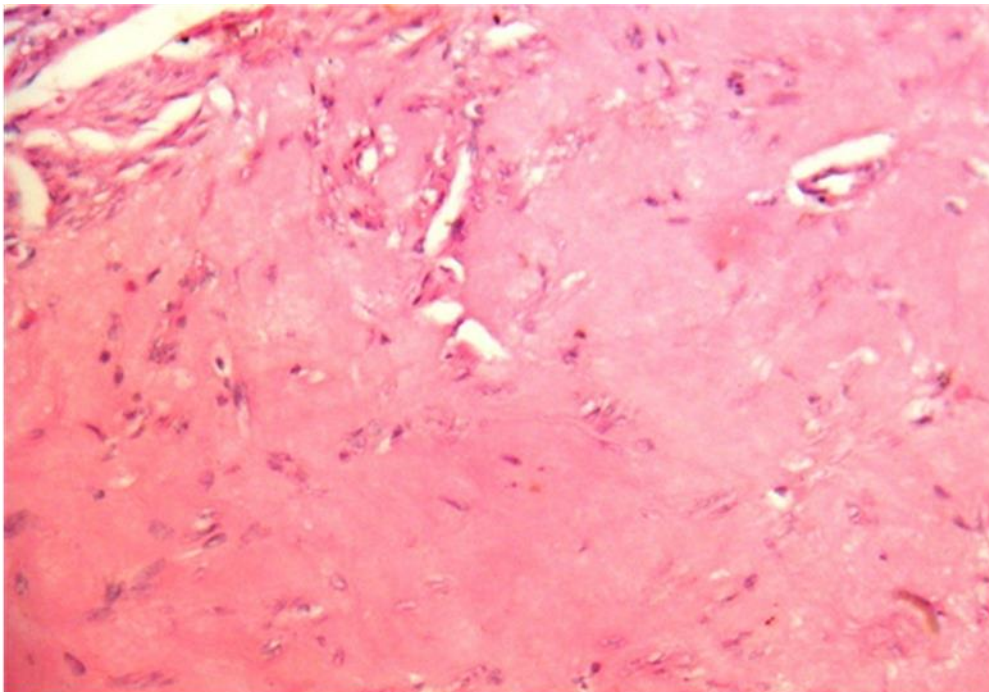


Figure6: Histology of Densely collagen in Leiomyoma (Ancient Leiomyoma). H and E. X 400

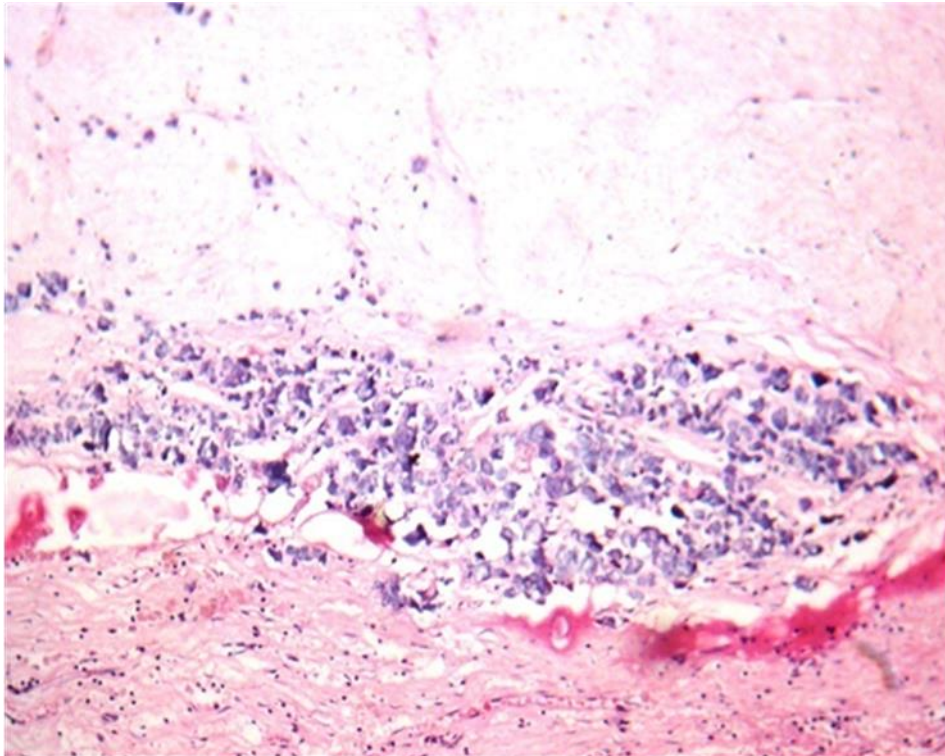


Figure 7: Histology of fascicle of smooth muscle with minimal intervening collagen and extensive dystrophic calcification. H and E. X 200

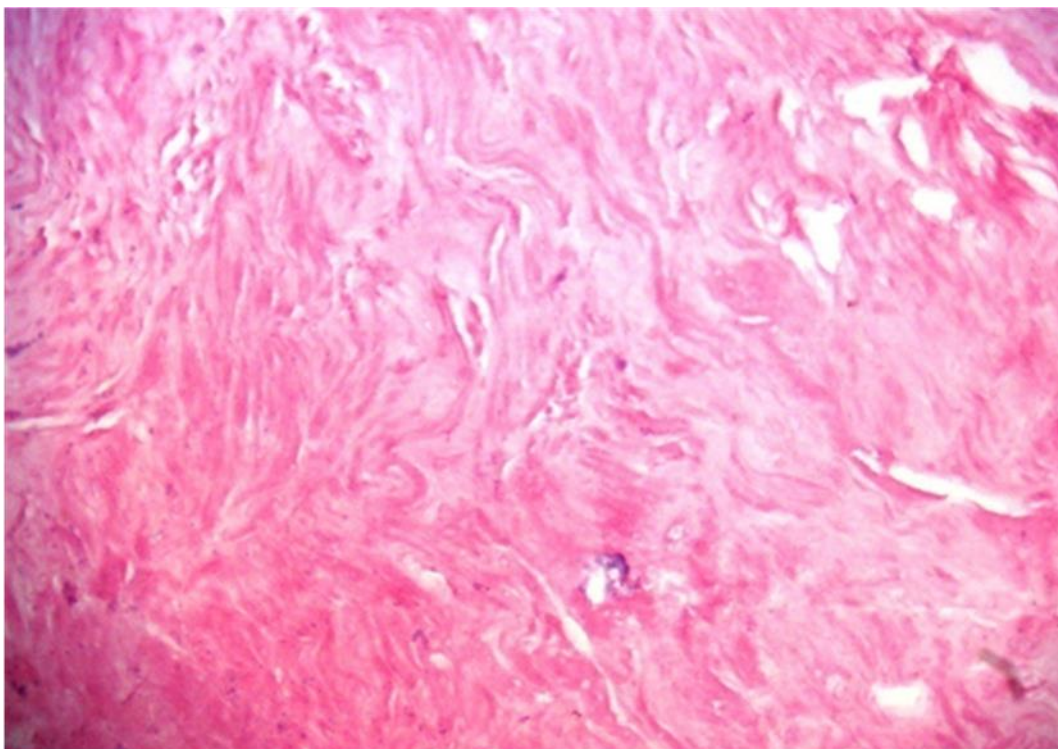


Figure 8: Histology of leiomyoma with hyaline changes. H and E. X 200

Discussion

384 cases of leiomyoma diagnosed in the study period 2003 to 2012 were available for review and

analysis in this study. The yearly distributions of uterine leiomyoma in relation to surgical biopsy show that, the total number of surgical biopsy was

10,397 and total number of uterine leiomyoma diagnosed was 384 representing 3.69% prevalence for the period under review. The highest number of uterine leiomyoma diagnose with 66 and 64 respectively, for 2011 and 2012. The year 2003 has least number 4, but in 2005, there was no surgical biopsy for uterine leiomyoma.

Observation from this study indicated that the number of uterine leiomyoma diagnosed in Usmanu Danfodiyo University Teaching Hospital Sokoto increased from 2010 to 2012, with highest number of uterine leiomyoma occurring in 2011 based on the number of surgical biopsy diagnosed in the Hospital.

The results from this study shows that the incidence of uterine leiomyoma among the women under this study (17.19%) was relatively lower than the incidence rate of 25.9% reported in Enugu (Ozumba et al., 2011). Our finding is however in agreement with an incidence range of 17.9% - 26% obtained in some other Nigerian studies by Sagay et al. (1998) and Vollenhoven et al. (1990). Nevertheless, the incidence rate (17.19%) obtained in this study, is obviously higher than the incidence rate of 11% obtained in Europe and United States (Ogedengbe, 2003) and 2.8% reported from Ghana (Nkyekyer, 2000). Many studies obtained from many parts of Nigeria are also lower than the incidence rate obtained in this study. Specifically, 7.6% and 8.35% were obtained from Ife and Ilesha (both in Osun State) respectively (Ogunniyi, 1990; Sankaran and Manyonda, 2008); 3.2% from Sagamu, Ogun State (Akinyemi et al., 2004), 3.0% and 13.4% from Ilorin, Kwara State (Omokanye et al., 2012; Aboyeji and Ijaiya, 2002), and 10.7% from Nnewi, in Anambra State (Ezeama et al., 2012) as well as ---% from Kano State (Yakasai et al., 2013). Our observed prevalence is also higher than an incidence range of 4.18-4.7% reported from Port Harcourt (Briggs and Katchy, 1990) and Zaria (Emembolu and Ekwempu, 1988). The reason for the high incidence rate observed in Usmanu Danfodiyo University Teaching Hospital Sokoto may be due to the fact that the hospital receives a significant number patients, not only from Sokoto state, but also from neighbouring states, like Zamfara and Kebbi State. This may account for the high incidence rate obtained in this study.

However, from the results of this study it was observed that uterine leiomyoma was predominant among women of reproductive age (36 to 39 years). This finding is corroborated by a previous study which indicated that uterine leiomyoma grow in women of child bearing age (Newbold et al., 2000),

making surgical intervention inevitable with its attendant morbidity. Our finding is also in agreement with the high incidence of uterine leiomyoma reported by some other authors (Vollenhoven et al., 1990; Sagay et al., 1998; Aboyeji and Ijaiya, 2002 and Akinyemi et al., 2004). The results of this study also supports the fact that uterine leiomyoma is a hormone-dependent tumour that follows the reproductive life cycle of women (Cramer et al., 1995; Schwartz et al., 2000a,b) and signs of uterine leiomyoma become apparent by the age of 30 (Otolorin et al., 1989; Sagay et al., 1998; Olatinwo and Offiong 2000).

Furthermore, the high rate of uterine leiomyoma observed among women within the 36-39 age range in this study might be associated to the high exposure to other risk factors such as reproductive tract infections and abortion due to their involvement in risky social behaviours. Evidence from previous studies indicated a high incidence of uterine leiomyoma among patients with pelvic inflammatory disease as well as infertility (Sagay et al., 1998; Vollenhoven et al., 1990; Gross, 2000; Omokanye et al., 2012). Some evidences shows that diet can also be one of risk factor especially meat consumption (Flake et al., 2003), while myometrial irritation as a result of pelvic infections, has also been connected with uterine leiomyoma (Adinma, 1994; Stewart and Nowak 1998; Gross et al. 2000) and may be one cofactor for the high rate of uterine leiomyoma among Black women.

A previous study among randomly selected women between 35 to 49 years, who were screened by self-report, medical record as well sonography indicated that the rate of uterine leiomyoma by age 35 was 60% among African-American women, increasing to > 80% by age 50, whereas Caucasian women showed an incidence of 40% by age 35, and almost 70% by age 50 (Baird et al., 2003). Apart from race, other possible risk factors for developing uterine leiomyoma are early age at menarche (Marshall et al., 1998) familial predisposition (Vilkhyaeva et al., 1995) and overweight. Parity (Parazzini, 2006) and smoking may protect women from developing uterine leiomyoma (Lumbiganon et al., 1996).

In this study, we observed the highest percentage of uterine leiomyoma of 17.19% in 2011. Also the highest distribution of uterine leiomyoma occurred in women in the 30-39 years age group (36.39%), while the prevalence was lowest in the 0-9 years and 80-89 years age group (0.26% and 1.04%) respectively. The different types of uterine leiomyoma diagnosed in this study included

Subserosal, Intramural as well as Submucosal. Most of the myomata were in many sites and on subcategorization of location, the most common site was Intramural (69.01%), then Submucosal with (24.74%) followed by Subserosal (6.25). Our finding is in agreement line the study reported by Akinyemi et al. (include year) which shows that the most common site of of uterine leiomyoma are Intramural (70%), Submucosal (20%) and Subserosal (10%). The finding from this study shows that all myomata start intramurally before migrating outward or inward as the case may be.

Conclusion

Uterine leiomyoma is the highest of all leiomyoma affecting uterine smooth muscle also the highest benign tumour affecting women. This tumour affects mostly women of middle age and late of reproductive age. Many literatures and researches have shown that, the chances of uterine leiomyoma are higher among Black women. This study compares favourably with others in our environment and has not shown any huge difference with respect to incidence, clinical presentation, and complications of uterine leiomyoma. The high incidence of uterine leiomyoma among women within the 30-39 age range might be as a result of low level of educational attainment among women in the area as well as other risk factors such as reproductive tract infections and abortion. Judging by the findings of this study, it is obvious that uterine leiomyoma remains a public health concern; uterine leiomyoma must be given the attention it deserves. We recommend that an effective awareness/screening, sensitisation of women in the area encouraging them to report early for assessment of such illnesses is advocated. Also, training of staff to enable centres offer the newest techniques to the patients is encouraged.

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