Prevalence of Uterine Leiomyoma Coexisting with Intrauterine Pregnancy

Shire Ebere Mercy[1], Lekpa K. David[2]

[1]*Rivers State College Of Health Science and Management Technology, Port Harcourt, Nigeria*
[2]*Department of Anatomy, Faculty of Basic Medical Science, College of Health Sciences, University of Port Harcourt, Nigeria*

Abstract: **Uterine myoma also known as fibroid is a mass of compacted smooth muscle and fibrous tissue that grows on the wall (or sometimes on the outside) of the uterus. Estrogen and progesterone are recognized as promoters of tumor growth. During pregnancy, the influx of these hormones are said to have effects on the co-existing myomas. The objective of this study was to establish the prevalence of uterine leiomyoma coexisting with intrauterine pregnancy and investigate the relationship between patient age, gestational age (GA), myoma size and location of myomas in pregnant women living in Port Harcourt Metropolis, Rivers state Nigeria. It is a retrospective study from June 2010 to December, 2018. Data was obtained from case files of 150 gravid female patients (with myoma = 80, without Myoma = 70) who reported for ultrasound scans, these files were evaluated and analyzed using their Gestational age to compare the size of myoma. From the results there was a remarkable increase in myoma existing with pregnancy with rise in maternal age. A total of 35 patients between the ages of 40-45years were scanned and were found to have the highest number of myomas coexisting with their pregnancies (with myoma, n=30(85.71%). This was closely followed by patients between the ages of 35-39 years were 50 subjects where scanned and 50% had myomas coexisting with their pregnancies (with myoma, n=25(50%)). Patients between the ages of 20-24years had the least number of myoma coexisting with their pregnancies (with myoma, n= 3(33.33%)). The various age distribution of subjects and fibroid incidence was analyzed using chi-square (X^2 = 28.471, df = 5, p value=0.00002). Patients between ages 40-45years has the highest number of pregnancies coexisting with uterine fibroids in Port Harcourt Metropolis, Rivers State, Nigeria. Ultrasonography is an important modality used in detecting the presence, size and location of myomas especially in early pregnancy. The growth pattern of myoma in pregnancy in our locality was significant. Myomas grow in pregnancy at 3-6 weeks interval (4.5 weeks mean interval) at the growth rate of 0.667mm per week especially from first trimester to second trimester. The incidence of myoma in this study was 53.5% and was found to be significant in women of age 40-45 years. The most common fibroids are subserous (20%), Submucous (20%) and intramural fibroids(20%). Follow-up scans should always be requested in cases of leiomyoma co-existing with pregnancy to determine any change in size of myoma as the pregnancy progresses.**

I. INTRODUCTION

Fibroids are important features in pregnancy now than in the past because many women are delaying child bearing to their thirties, the time of greatest risk for fibroid growth (Vollenhoven et al., 2000). Several studies showed that the actual etiology of myomas is unknown but there are growth factors which are also risk factors of fibroid tumorigenesis. The factors with increased risk are: early menarche and age (late reproductive years) (Marshall et al., 2000), parity (Marshallet al., 2006), obesity) Marshall et al., 2006), African-American ethnicity (Baird et al., 2002) and tamoxifen (Deligdisch, 2000).

Pregnancies may be faced with adverse outcomes without clear risk factors. Therefore assumptions have been made that routine ultrasound in all pregnancies will prove beneficial by enabling early detection of some risk factors and improve management of pregnancy complications (Vollenhoven et al., 2000). According to Buttram (1986) a common clinical perception prevails that myomas increase in size during pregnancy. With the advent of ultrasonographic studies, however, several reports have noted that only a minority of myoma (one-third or less) increase in size during pregnancy, whereas the majority remain stable or decrease in size (Aharoni et al., 2003; Rosati et al., 2002; Strobelt et al., 2004). In a prospective study by Aharoni et al., (2003), 32 leiomyomas (fibroids) in 29 pregnant women were examined with ultrasound every 3-8 weeks. Each patient had between 3 and 6 scans (mean 4.4) during the course of pregnancy and 13 patients had a final scan at 6 weeks postpartum. An individual growth curve was established for each tumour and the patterns of growth were analyzed. No increase in size during the pregnancy was observed in 25 fibroids (78%). Only 7 (22%) increased in size but by no more than 25% of the initial volume. At 6 weeks postpartum the size of the fibroids did not differ significantly from the size during pregnancy. The larger the myoma, the greater the likelihood of growth (Strobelt et al., 2004). Myoma size can increase as a result of hypertrophy and edema, while shrinkage of the tumor may occur as a result of degenerative changes secondary to ischaemia. Rosati et al., (2002) examined sonographically 36 pregnant women with a single uterine myoma at 2 to 4 weeks intervals. The initial diagnosis was made in 12 patients before pregnancy and in the other 24 patients between 9 and 12 weeks of gestation. Thirty-four women had a scan 4 weeks after delivery. A reduction in size was observed in puerperium, which may indicate a return to its initial volume.

Estrogen and progesterone are recognized as promoters of tumor growth. During pregnancy, the influx of this hormones are said to have effects on the co-existing myomas (Goodman et al., 2006). Uterine myomas usually develop before pregnancy and because many women experience no symptoms, they may not realize they have them until they

have an ultrasound scan during their pregnancy. The co-existence of leiomyomas and pregnancy may have a negative impact on the obstetric outcomes (Benson et al., 2001; Qidwai et al., 2006). Routine ultrasound may therefore be encouraged in all pregnancies, in order to detect myomas or any other lesions early enough for better obstetric management.

Uterine fibroids usually grow, but very slowly and can be the size of a pea, sometimes the size of a grapefruit and in some cases even larger (Prodigy, 2005). Some women have fibroids but experience no symptoms; others experience excessive menstrual bleeding, dyspareunia, bladder irritation and frequent urination, depression and pelvic pressure (United Kingdom Midwifery Archives, 2002).

About 1 in every 15 women with infertility has fibroids, but the fibroids are usually innocent bystanders (Prodigy, 2005). They cause only 2% to 3% of cases of infertility. Fibroids that block one or both of the fallopian tubes may prevent sperm from fertilizing an egg, while fibroids that fill the uterine cavity may block implantation of a newly fertilized egg (Pritts, 2001).

The incidence of sonographically detected myomas during pregnancy is generally low, about 1.5% in one study (Cooper et al., 2005). It appears that there is an increased risk of pregnancy loss associated with the presence of uterine fibroid in early pregnancy, especially with multiple large fibroids. One review suggests that fibroids are probably commoner than thought in pregnancy, but cause fewer problems than has traditionally been thought (Ouyang et al., 2006). There is a generally held conception that fibroids usually increase in size during pregnancy depending on the nature, size and location of the fibroids. Some longitudinal studies showed that this is not so, while others opined that if they enlarge, it is usually during early pregnancy (Benson et al., 2001).

II. MATERIALS AND METHOD

The study was a descriptive from June 2010 to December 2018 using a total of 150 patients that presented for obstetrics ultrasound at the ultrasound department of Rivers state University Teaching Hospital. The data was collected retrospectively from files of 150 gravid female patients who reported for ultrasound scans and record book of delivery in obstetrics and gynecology department. The information obtained from the case files includes: Patient's name, age, gender, gestational age, clinical history and date of examination. The data was collected from reports of all pregnant females referred for ultrasound scan who met the inclusion criteria within June 2010 and December 2018. SI-400, SS1-600 and Sonoline-sienna DAE0237 real time scanners with curvilinear and linear transducers of 3.5MHz, 5.0MHz and 7.5MHz frequencies respectively were used for the study. The rationale for the use of different probe frequencies was borne out of varying need for penetrability especially in the 2nd and 3rd trimesters where penetration is needed to visualize the posterior aspect of the gravid uterus to demonstrate the myoma located there. The research was carried out at the Radiology Department of selected Hospitals to include Rivers state University Teaching Hospital, Port Harcourt. The incidence of myomas in pregnancy in the locality was determined by percentage and the level of significance was established using Chi-square test at $p < 0.05$.

III. RESULTS

Table 1: Age distribution of subjects and fibroid incidence

Age	With Myoma	Without Myoma	Total
15-19years	0(0.00)	10(100.00)	10
20-24years	3(33.33)	6(66.66)	9
25-29years	12(46.15)	14(53.85)	26
30-34years	10(50.00)	10(50.00)	20
35-39years	25(50.00)	25(50.00)	50
40-45years	30(85.71)	5(14.28)	35
Total	80(53.3%)	70(46.6%)	150(100%)

$X^2 = 28.471$, df = 5, pvalue=0.00002

Table 1 showed that there was a remarkable increase in myoma existing with pregnancy with rise in maternal age (p-value = 0.00002).

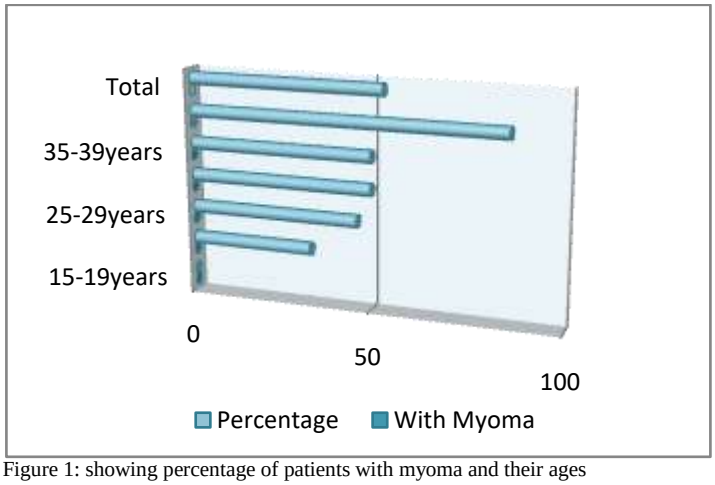

Figure 1: showing percentage of patients with myoma and their ages

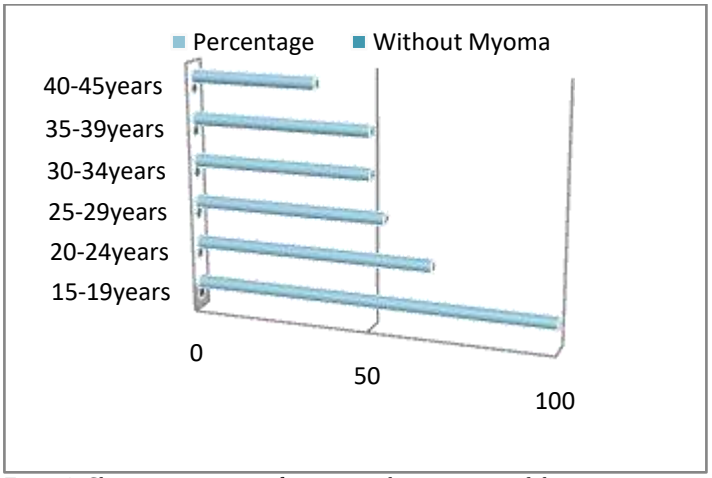

Figure 2: Showing percentage of patients without myoma and their ages

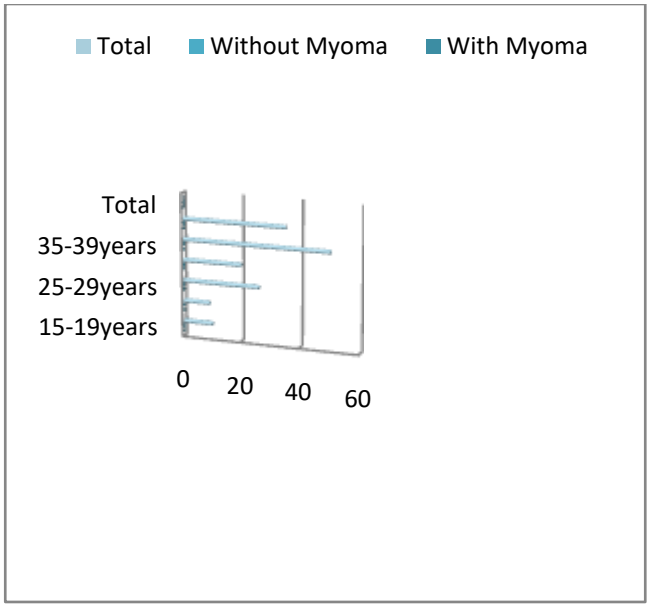

Figure 3: showing total number of patients with and without myoma who presented for scan.

Table 2: Distribution of fibroid types

Types of Fibroid	Frequency	Percentage (%)
Subserous	20	25
Submucous	20	25
Pedunculated	10	17.5
Intramural	20	25
Cervical	5	6.25
Retroplacental	5	6.25
Total	80	100

In table 2 above subserous, submucous and intramural myoma 20(25%) occurred highest compared to retroplacental and cervical myomas 5(6.25%) which had the least occurrence.

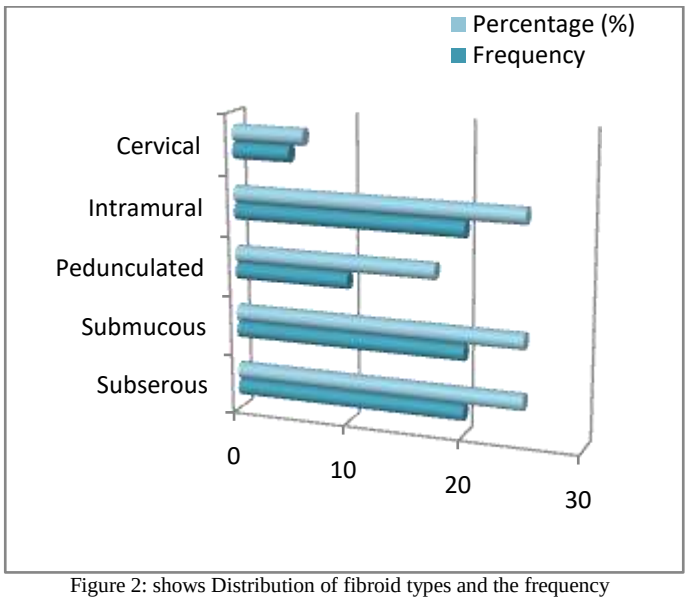

Figure 2: shows Distribution of fibroid types and the frequency

Table 3: Distribution of fibroids with gestational age of three scans sequence

Gestational Age	1st Scan Sequence N	%	2nd Scan Sequence N	%	3rd Scan Sequence N	%
6-10 weeks	16	20.00	10	12.50	12	15.00
11-15weeks	20	25.00	12	15.00	15	18.75
16-20weeks	14	17.50	20	25.00	14	17.50
21-25weeks	15	18.75	20	25.00	6	7.50
26-30weeks	15	18.75	10	12.50	25	31.25
31-35weeks	0	0	4	5.00	6	7.50
36-40weeks	0	0	4	5.00	2	2.50
Total	80	100	80	100	80	100

Table 3: shows the number of myomas discovered in different gestational age group during the scan sequence.

IV. DISCUSSION

Incidence of myoma in pregnancy in this locality is quite high considering the population size of Rivers State, Nigeria. In this study, 53.5% of patients had myoma coexisting with their pregnancies, which could be interpreted as: in every 1000 pregnant women in our locality over 100 have myoma co-existing with their pregnancy; statistical significance was observed when compared to all ages of women with fibroid. It was high in women between ages 35-45years. This may be due to the opinion that women of this present time are delaying child bearing to their thirties, the time of greatest risk for fibroid growth (Vollenhoven et al., 2000). However several studies on the incidence of myoma have been carried out in different locations by different researchers all over the world and they observed that the incidences obtained vary with the population sizes studied. In Poland, Batoniak et al., (2002) studied a population size of 670 and obtained an incidence of 24% and this was found to be statistically significant in women of 25 years and above. The population size and findings of these researchers are similar to the findings of this present study. Present work studied 150 with an incidence of 53.5% (80) and was found to be significant in women of age 30-45 years.

Bosev et al., (2007) in Germany, found that single myoma were more predominant than multiple myomas and that study corroborated the findings of Exacoustos et al., (2003) in Italy. Contrary to this however, in the present study, multiple myomas predominated slightly more than single myomas. Multiple myomas may pose more serious complications such as preterm birth, severe pains and loss of pregnancy. In obstetric literature it is viewed that myomas enlarge during pregnancy and shrink during the puerperium (Pritchard, 2005). However, several studies have rejected this concept of true fibroid growth during pregnancy (Goldzieher et al., 2009). A group reported that there was no significant size change in 38 of 41 myomas during pregnancy during the second half of pregnancy (Muram et al., 2009). Another group

reported that 31 of 54 fibroids developed red degeneration during pregnancy without any size change while the remaining myomas tend to increase in size rapidly during pregnancy (Hsddsni, 2008). With the advent of ultrasonographic studies however, several reports have noted that only a minority of myoma (one third or less) increase in size during pregnancy whereas the majority remain stable or decrease in size (Aharoni et al., 2003; Rosati et al., 2002; Strobelt et al., 2004). Present study showed growth in size of myoma at 3 to 6 weeks interval of pregnancy progression at the growth rate of 0.667mm per week especially from first trimester to second trimester. This finding agrees with that of Bosev et al., (2007) who studied the changes in myoma dimension during the first, second and third trimesters respectively and reported a change in size from the first to second trimester.

Anna et al., (2007) found that myomas depend on their previous size and that small myomas tend to increase in size during the first and second trimester and decreases in size during the third trimester. They also found that large myomas tend to increase in size only in the first trimester and decrease in size during the second and third trimester. Their findings corroborated with the results of this present study. In this present study, a reduction in mean size of myoma was discovered in the 3rd trimester (3rd scan sequence), Lamb et al., (2008) found that myoma cell hypertrophies during pregnancy and possibly explain the measured fibroid growth trends. The cells in small fibroids enlarge during pregnancy and shrink in late pregnancy. The decrease in size observed in late pregnancy, by some studies, could be explained in part by the decrease in cell size. Myoma cells have a greater number of estrogen receptors than surrounding normal myometrial cells (Tamaya et al., 2005). Therefore, these cells should be more responsive to the increased concentrations of estrogens present during pregnancy and exceed the growth of the surrounding myometrium.

Progesterone on the other hand may inhibit the growth of fibroids and even induce degenerative changes and involution (Goodman et al., 2006). The increasing progesterone level in late pregnancy could explain the decrease in fibroid size during that period.

V. CONCLUSION

The growth pattern of myoma in pregnancy in our locality is significant. Fibroids grow in pregnancy at 3-6 weeks interval (4.5 weeks mean interval) at the growth rate of 0.667mm per week especially from first trimester to second trimester. The incidence of myoma in this study was 53.5% and was found to be significant in women of age 30-45 years.

The most common fibroids are subserous, Submucous and intramural fibroids. Myoma in pregnancy contributes to a high percentage of obstetric outcomes and CS when compared to pregnancies without myomas. Therefore, sonography of pregnancy with myoma should be carried out carefully and timely (routine), noting the size changes, location and number of myoma in order to provide quality obstetric management to the patients.

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