

Research Article

Surgical and Delivery Outcomes of Coexisting Uterine Fibroids with Pregnancies in Nigeria

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Abstract

Background: Coexisting uterine fibroid with pregnancy is associated with increased pregnancy complications. This study evaluates the prevalence of coexisting uterine fibroids, and surgical and delivery outcomes among pregnant women who had cesarean sections.

Methods: This comparative observational study was conducted among pregnant women who had cesarean sections at the labor ward operating room of Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. One hundred and five pregnant women aged 20 years - 40 years were recruited and grouped based on the intraoperative presence of grossly visible uterine fibroids ($n = 23$) and no uterine fibroids ($n = 82$). Surgical and delivery outcomes were measured. Data were analyzed using IBM SPSS version 26 and the means between the two groups were compared using an independent sample t-test with significance set at $p < .05$.

Results: The prevalence of uterine fibroids found during cesarean sections in this study was 21.9%. The mean age of the participants was comparable ($M = 30.25$ $SD = 5.232$). There were statistically significant differences in mean pre-operative packed cell volume ($t(df) = 2.077$ (65.31) $p = .042$, estimated blood loss ($t(df) = 2.045$ (36.664) $p = .010$, post-op packed cell volume ($t(df) = 1.054$ (24.035) $p = .049$, and duration of hospital stay ($t(df) = -2.35$ (65.846) $p = .019$). The study showed that there was a difference in mean surgery time = 7.996 95% CI: -.879 to 16.871 but this was not found to be statistically significant.

Conclusion: Uterine fibroid coexisting with pregnancy has a significant effect on the surgery time, estimated blood loss, and length of hospital stay. Therefore, adequate complication readiness and proper follow-up of the patient will be crucial to avert likely complications during and after surgery in women with coexisting uterine fibroid in pregnancy.

Introduction

Uterine fibroid is a common benign neoplasm of the female genital tract and it is prevalent in Africa [1,2]. Myomas are the most frequently recorded benign smooth muscle tumor of the uterus, affecting 20% - 60% of women of reproductive age and negatively impacting fertility and the outcome of pregnancy [3]. The incidence of uterine fibroids increases with age [4].

The incidence of uterine fibroids in pregnancy reportedly ranges from 0.1% to 10.7% of all pregnancies and increases as women choose to postpone the onset of reproduction [5]. Research has shown that 10% - 40% of prepartum complications in pregnancy are associated with coexisting uterine fibroid [1].

At present, although there is a lot of research about the prevention and treatment of uterine fibroids, the aetiopathogenesis of uterine fibroids is still unclear. Epidemiologic profile suggests that uterine fibroids are initiated and/or maintained by stimuli that last for the duration of ovarian activity. Although gonadotropins [6], adipokines [7], and ovarian peptides may be postulated to have some influence on fibroid onset and growth, oestradiol and progesterone are the strongest candidates to play such roles [4].

There are conflicting data on the relationship between obstetric outcomes and uterine fibroids. Pregnancy-related hormones influence the size of uterine fibroids and have many impacts on pregnancy. Many retrospective studies using

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ultrasonography to monitor the progressive change in the size of uterine fibroids throughout pregnancy have demonstrated that 60% - 78% of fibroids do not show any significant change in volume during pregnancy [8-10]. However, in about 22% to 32% that increased in volume, the growth was limited almost exclusively to the first trimester, most especially the first 10 weeks of gestation with very little if any growth in the second and third trimesters [1,8].

Some studies have shown that small fibroids are just as likely to grow as large fibroids, whereas other studies have suggested that small and large fibroids (> 5 cm) have different growth patterns in the second trimester, but all decrease in size in the third trimester [1,8,10]. The majority of fibroids show no change during the puerperium, although 7.8% will decrease in volume by up to 10% [9,10].

Coexisting uterine fibroid in pregnancy is associated with many complications including miscarriages, preterm deliveries, placenta praevia, abruptio placentae, premature rupture of membranes, and malpresentation like breech and transverse lie [2]. Research has also shown that coexisting uterine fibroid in pregnancy increases the risk of cesarean delivery, prolonged or obstructed labor, uterine rupture, antepartum, intrapartum, and postpartum hemorrhage as well as uterine inversion and puerperal sepsis [1,2]. The babies are prone to early fetal loss, prematurity, fetal distress, newborn special care unit admission, perinatal morbidity, and mortality [11-14].

Several studies have reported that pregnant women with coexisting fibroid in pregnancies could not only carry their pregnancies to term but were also able to deliver healthy babies via spontaneous vaginal delivery [2,5]. However, the women were prone to some postpartum adverse effects including severe abdominal and pelvic pain, and intermittent hospital admissions with its associated financial cost [2,5].

Hence this current study aims to determine the prevalence, surgical, and delivery outcomes of coexisting uterine fibroids among pregnant women undergoing cesarean section in Ekiti State University Teaching Hospital, Ado-Ekiti, Southwest, Nigeria.

Methods

This observational study was prospectively conducted between the 1st of March and the 30th of April 2023 among women who had cesarean sections at the labor ward theatre of Ekiti State University Teaching Hospital. One hundred and five (105) pregnant women aged 20 years - 40 years who had caesarean section irrespective of whether elective or emergency were purposively selected for this study. The participants were informed and their consent was sought for the study. The patients were adequately prepared for the surgery and all the cesarean sections were performed by the consultants and senior registrar according to the departmental

protocol for the management of high-risk pregnancies. A proforma questionnaire was developed and used to collect data for this study.

Participants were categorized into the two study groups based on the intraoperative finding of the presence or absence of fibroids. Study group 1 was women with the intraoperative finding of uterine fibroids while control group 2, was women without intraoperative finding of uterine fibroids. Baseline socio-demographic characteristics, parity, estimated gestational age, duration of surgery, estimated blood loss, APGAR Scores, birth weight, duration of hospital stay, and pre- and post-operative packed cell volume were recorded and compared between the two groups.

The data obtained from both groups were compiled and analyzed using IBM SPSS version 26 and the statistical difference between the two groups was determined with the student's t-test. The results of the data were expressed as mean \pm SD (standard deviation) where $p < 0.05$ is considered significant.

Approval (protocol number: EKSUTH/A67/2023/08/003) to carry out the study was obtained from the Ethics and Research Committees of Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. We obtained the consent of all the patients before including them in this study. There was no implication for those who declined consent. There were no undue risks to participants during the process of data collection. There was no financial cost to the subjects at any study stage. The study complies with the guidelines of the Declaration of Helsinki, Good Clinical Practice, and the World Association for Social, Opinion, and Market Research (ESOMAR).

Results

Table 1 shows the age and obstetric characteristics of our clients in this study. The intraoperative prevalence of coexisting uterine fibroids found among pregnant women during cesarean sections in this study was 21.9%. The baseline characteristics of the two study groups such as sex (all female), age, gravidity, parity, and gestational age show no contrasting differences and are thus not statistically significant and hence comparable. Approximately eighty-four percent (83.8%) of the participants delivered at term while 1.9% had very preterm delivery. There were no recorded cases of very preterm deliveries among women with fibroid coexisting pregnancy whereas 2.44% of women in group 2 without uterine fibroids had very preterm deliveries.

Table 2 shows the surgical and delivery outcomes. An independent sample t-test was conducted to compare the means for statistical significance. The result showed statistically significant differences in means of pre-operative packed cell volume, post-operative packed cell volume, estimated blood loss, duration of the special care baby's unit admission, and Apgar score between the two study groups

Table 1: Age and Obstetric Characteristics.

Variables	Mean	Fibroid 23 n (%)	No fibroid 82, n (%)	N-Total (%) = 105	p - value
Age	30.25(5.28)	Mean = 32.61(5.79) Mode = 35 yrs; 4(17.39%)	29.59(4.97) 32 yrs, 11(13.41%)		.015*
Gravidity	2.00(.522)				.104
Primigravida		3(13.04%)	22(26.83%)	25(23.8%)	
Multigravida		17(73.91%)	55(67.07%)	72(68.6%)	
Grand-Multigravida		3(13.04%)	5(6.01%)	8(7.6%)	
Parity	2.58(1.31)				.909
Primiparous		6(26.09%)	25(30.49%)	31(29.5%)	
Multiparous		7(30.43%)	21(25.6%)	28(26.7%)	
Nulliparous		10(43.47%)	36(43.9%)	46(43.8%)	.042*
EGA	38.15(2.15)				.148
28 - 32 weeks		0	2(2.44%)	2(1.9%)	
33 - 36 weeks		3(13.04%)	12(14.6%)	15(14.3%)	
37 - 42 weeks		20(86.96%)	68(82.93%)	88(83.8%)	.046*

* $p < .05$ **Table 2:** Surgical and Delivery Outcomes.

Variables	Fibroid Present		Fibroid Absent		p - value
	Mean (STD)	Percent n (%)	Mean (STD)	Percent n (%)	
Pre-operative packed cell volume	36.09(2.41)	22.6%	34.65(2.43)	77.4%	.042*
Post-operative packed cell volume	32.00(3.48)	22.9%	30.30(3.64)	77.1%	.049*
Duration of surgery	44.43(25.29)	25.5%	36.44(16.84)	74.5%	.077
Estimated blood loss	506.52(488.58)	26.4%	396.71(196.83)	73.6%	.010*
Birth weight (kg)	3.13(.808)	22.1%	3.08(.731)	77.9%	.048
Apgar Score	1.83(1.723)	16.3%	2.63(2.61)	83.7%	.019
≥ 7	-	22(95.6%)*	-	67(81.7%)	
< 7	-	1(4.4%)	-	15(18.3%)	
Duration of hospital stay (days)	4.13(.626)	21.9%	4.17(1.127)	78.1%	.016

* $p < .05$

($p = .042$, $p = .049$, $p = .010$; $p = .016$ and $p = .019$). The majority of the neonates had good Apgar score of at least 7 at the first minute of life and their birth weight ranges between 2.5 kg - 3.49 kg. The mean scores for the duration of surgery were higher for group 1 when compared to group 2 though the magnitude of the difference was not statistically significant $p > .05$

Table 3 shows the regression analysis of the effect of co-existing uterine fibroid on measured surgery and pregnancy outcomes. Uterine fibroid significantly predicts post-operative packed cell volume, duration of surgery, estimated blood loss, and Apgar score F (1 = 103) = 3.969, $p < .05$ which indicates that co-existing uterine fibroid in pregnancy has predictable negative impacts on delivery and surgical outcomes.

Discussion

A prevalence of 21.9% of uterine fibroid co-existing with pregnancy was found in women who had cesarean sections in our labor room theatre during the study period. The prevalence of co-existing uterine fibroids with pregnancy has been underestimated because the diagnosis and estimation of the size of the leiomyomata in pregnancy are not straightforward [10]. Ultrasound scanning will only detect 1.4% - 2.7% of uterine fibroids in pregnancy due to the physiologic thickening of the myometrium. Even with physical examinations as done in this study, researchers had shown that it is only 42% of large fibroids (> 5 cm) and 12.5%

Table 3: Regression analysis.

Dependent variables	Beta Coefficient	R ²	F	p - value
Pre-operative packed cell volume	-.149	.022	2.332	< .05
Post-operative packed cell volume	-.192	0.037	3.969	.049
Duration of surgery	-.173	.030	3.192	.077
Estimated blood loss	-.159	.025	2.659	< .05
Apgar score	.136	.019	1.947	.166
Birth weight	-.002	.000	.000	< .05

*Independent Variable/ Predictor factor - Uterine fibroids.

of small fibroids (3 cm - 5 cm) would be detected [10,15,16]. This prevalence is higher than the range of 0.75% - 16.7% [17-19] in previous studies because our study is based on physical detection which is superior to the ultrasound scanning diagnosis used in other studies. However, our study did not also include the women who achieved vaginal deliveries with co-existing uterine fibroids and others with uterine fibroids too small to be visible physically. This is the first study to the best of our knowledge that reported the prevalence of uterine fibroids co-existing uterine fibroids detected during cesarean section in our environment.

The majority of our participants 68.6% were multigravidas and those with uterine fibroids were older with a mean age of 32.61 compared with 29.59 in those without uterine fibroids. These findings are consistent with other studies linking uterine fibroids with spontaneous miscarriages, postponement of pregnancy, and infertility [17-20]. About



13.04% of our patients with uterine fibroids in this study had their deliveries 36 weeks and below. This is lower than 17.1% among women in the second group of this study who had no uterine fibroids. This is contrary to earlier studies that revealed higher incidences of preterm deliveries among women with uterine fibroids than women without [21-25] Landman, et al. considered 11 eligible articles in a systematic review and meta-analysis involving 256,650 singleton deliveries comprising 12,309 with fibroids and 244,341 without fibroids concluded that the increased risk of preterm birth associated with preterm deliveries was stronger at earlier gestational ages [26]. Our participants in this study were recruited during cesarean sections which were performed after the age of fetal viability. Similarly, in their prospective study of women diagnosed with uterine fibroids, Sundermann, et al. opined that if fibroids are associated with preterm births, the proportion was lower than previously stated [27]. The lower proportion of preterm delivery among women with co-existing uterine fibroids in our series may not be unconnected with our practice of regarding women with coexisting uterine fibroids as high-risk pregnancies and giving them close monitoring during antenatal care.

We found a statistically significant difference in the mean pre-operative packed cell volume of group 1 with fibroid coexisting and those without $p = .042$. Menorrhagia, a common complication of uterine fibroid might cause women with uterine fibroids to get pregnant with a suboptimal hemoglobin concentration that is further worsened by the dilution anemia of pregnancy. There was also a significant difference in the mean postoperative packed cell volume between the two study groups $p = .048$.

We equally found a significant difference in the mean of the estimated blood loss between the two study groups ($p = .010$). This is consistent with findings by earlier researchers who had demonstrated varying degrees of postpartum hemorrhage in parturients with uterine fibroids coexisting [21,28-30].

Zhao, et al. demonstrated that coexisting uterine fibroids are significantly associated with postpartum hemorrhage (Adjusted Odd Ratio 1.2, 95% CI 1.1 ± 1.4) and the rates of PPH significantly higher with increasing size of the uterine fibroid ($p < 0.001$) [2]. They also reported a statistically significant impact of the location of the fibroid (intramural, submucosal, or subserosa) on the risk of PPH (5.6% [subserosa] vs. 4.7% [submucosal] vs. 8.6% [intramural]) [2].

In this study, we found a longer than usual duration of cesarean operation time in women with uterine fibroids than women without, however, this was not statistically significant as high-risk pregnancies like uterine fibroids coexisting are left for higher trained personnel within the specialty in our hospital. The prolongation of the duration of surgery could also partly explain the significance found in the degree of blood loss.

This study also demonstrated significant differences in the mean Apgar Score and longer duration of admission in

the special baby care unit between the two study groups. These could also have occurred because of the increase in the duration of the cesarean section found in this study. Egbe, et al. found significantly lower Apgar scores in Cameroon among women who had uterine fibroids when compared with their counterparts without uterine fibroids (OR = 6.0; 95% CI 1.9 - 1,91; $p = 0.002$) [17].

In this study, we found a statistically significant effect of co-existing uterine fibroid on measured surgery and pregnancy outcomes. Uterine fibroid significantly predicts pre- and post-operative packed cell volume, estimated blood loss, and birth weight $F(1 = 103) = 3.969, p < .05$ which indicates that co-existing uterine fibroid in pregnancy has negative impacts on these delivery and surgical outcomes. Although not statistically significant, this study also demonstrated that coexisting uterine fibroids with pregnancy have negative effects on the duration of surgery, and Apgar score.

This study has some inherent limitations because of the population and sample size, the prevalence found in this study did not capture women who had vaginal deliveries during the study period. Similarly, there might also have been women who had small fibroid nodules not detected at cesarean sections. A larger sample size will be considered in future studies to increase the power of the study. The strength of this study was that we directly inspected the uteri for the presence of uterine fibroids which would have yielded a higher pick-up rate during pregnancy than ultrasound scanning.

Conclusion

The cause-and-effect impact of uterine fibroids on fertility has shown that women with uterine fibroids except in expectational cases can retain their full fertility potential. The anxiety associated with uterine fibroids among women within the reproductive age group is high, particularly in Africa where the diagnosis of uterine fibroids is seen as a recipe for a disaster. However, this current study dispels some of the insinuations that may be causing serious anxiety in our women and health care providers, however, uterine fibroid coexisting with pregnancy has a significant effect on the surgery time, estimated blood loss, and length of hospital stay. These negative impacts of uterine fibroid coexisting with pregnancy on surgical and delivery outcomes are to a large extent very predictable. Therefore, adequate complication readiness and proper follow-up of the patient will be crucial to avert likely complications during and after surgery in women with coexisting uterine fibroid in pregnancy.

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