

## Uterine fibroid and pregnancy outcomes in Khartoum Teaching Hospital, Sudan

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### Abstract

**Objectives:** To investigate the effect of uterine fibroids on pregnancy outcomes.

**Methods:** This case-control study was conducted in the Khartoum Hospital, Sudan, during June 2011 and through May 2012. Cases were pregnant women who have uterine fibroids, diagnosed by ultrasound scan or discovered accidentally during caesarean section. One consecutive pregnant woman who have no uterine fibroids per case acted as control. We included all

pregnant women who attended the labour ward, or planned for either normal or operative delivery, in the hospital, during the study period, and accepted to participate in the study.

**Results:** Using logistic regression analyses there was significant association between: delayed to conceive (CI= 2.9 – 11.1, OR= 5.7, P= <0.001), miscarriage (CI= 3.7 – 18, OR= 26.4, P= 0.001), experience of pain during pregnancy necessitating hospital admission (CI= 4.1 – 25.7, OR= 10.3, P= <0.001), antepartum haemorrhage (CI= 0.01 – 0.5, OR= 0.07, P= 0.010), uterine atony (CI= 0.02 – 0.56, OR= 0.1, P= 0.008), need for blood transfusion as a result of uterine atony (CI= 0.8 –6.5, OR= 2.2, P= 0.032), and uterine fibroids in pregnancy, compared to women without uterine fibroids. Pregnancy with uterine fibroids also had a higher unplanned caesarean section rate (CI= 0.1 –0.8, OR= 0.3, P= 0.014), but there was no differences in perinatal outcomes (Delivery at term, living births, birth weight, and preterm birth. between the two groups of the study.

**Conclusion:** Uterine fibroids increase the risk of adverse obstetrics outcomes during pregnancy and childbirth in a varying ways. This information can be used to aid counselling and risk-stratifying patients.

**Key words:** Fibroid, pregnancy outcome, Sudanese women health

### المستخلص

الورم الليفي في الرحم و نتائج الحمل في مستشفى الخرطوم التعليمي ,السودان

الأهداف: للتحقيق في تأثير الحميه الرحمية على نتائج الحمل في مستشفى الخرطوم التعليمي.

**الأدوات والطرق:** أجريت هذه الدراسة الإفرادية في "مستشفى الخرطوم، السودان"، خلال يونيو ٢٠١١، ومن خلال أيار/مايو ٢٠١٢. شمل البحث النساء الحوامل الذين لديهم لحميات شخصت بالموجات الصوتية أو أثناء القيصرية. امرأة حامل واحدة على التوالي بدون لحمية تم تضمينها بمثابة عنصر التحكم. قمنا بتضمين جميع النساء الحوامل اللاتي حضرن جناح المخاض، أو خطط لهم للولادة الطبيعيه في المستشفى، خلال فترة الدراسة، وقبل المشاركة في الدراسة.

**النتائج:** باستخدام تحليل الانحدار اللوجستي كان هناك ارتباط كبير بين تأخير الحمل ( $CI = 2.9 - 11.1$ )، أو  $P = 0.001$ ، أو  $P = 0.001$ ، الإجهاض ( $CI = 3.7 - 18$ )، أو  $P = 0.001$ ، الشعور بالألم أثناء الحمل الذي يستلزم دخول المستشفى ( $CI = 4.1 - 25.7$ )، أو  $P = 0.001$ ، النزف قبل الولادة ( $CI = 0.01 - 0.5$ )، أو  $P = 0.001$ ، وني الرحم ( $CI = 0.02 - 0.56$ )، أو  $P = 0.008$ ، الحوجه لنقل الشد نتيجة وني الرحم ( $CI = 0.8 - 6.5$ )، أو  $P = 0.032$ ، تلاحظ ارتفاع معدل القيصرية غير المخطط لها ( $CI = 0.1 - 0.8$ )، أو  $P = 0.014$ ، ولكن لم تكن هناك أية اختلافات في نتائج الفترة المحيطة بالولادة (الولادات الحية، الخداج الولادة.. إلخ)، بين هاتين المجموعتين من الدراسة.

**الاستنتاج:** اللحمية الرحمية تزيد من خطر النتائج السلبية للتوليد أثناء الحمل والولادة بطرق مختلفة. يمكن استخدام هذه المعلومات للمساعدة في اسداء المشوره وتفاوت المخاطر للمرضى

**الكلمات الرئيسية:** الورش الليفي، نتيجة الحمل، صحة المرأة السودانية .

## Introduction

Uterine fibroids are the most common benign gynaecologic tumors; they are present in 80% of women of reproductive age, and are found in 1% to 10% of women during prenatal ultrasound screening. Incidence of fibroids noted during second-trimester ultrasound was reported to be 3% in a large single-institution cohort study (1,2). Most of the fibroids are a symptomatic and they are more frequently found in elderly primigravidae and in certain ethnic populations; and more likely to have additional comorbid medical conditions (eg, higher body mass index, diabetes, and chronic hypertension) when compared with those without fibroids (3,4). The potential impact of

fibroids on pregnancy has been evaluated in numerous studies (2). The topic is becoming more relevant in contemporary obstetrics due to the demographic shift towards delayed childbearing, the rising rate of obesity, and the increased number of pregnancies occurring after the treatment of fibroids. Fibroid may cause some adverse outcomes during pregnancy, delivery and the postpartum period. Women with uterine fibroids are more likely have pregnancies complicated by fetal malpresentations, preterm birth, preterm premature rupture of membranes (PPROM), placenta praevia, placental abruption, caesarean delivery, and severe postpartum haemorrhage (2,3). The two most important factors in determining morbidity are size and locations [4]. Proximity to the placental implantation site is equally important, specifically in cases of miscarriage, placental abruption, preterm labour, and postpartum haemorrhage (6). Uterine fibroids may reduce fertility in 1-2% of cases (7), and cause increase in spontaneous and recurrent miscarriages by up to 40%, though available data is contradictory and inconclusive (8). This study was carried out to evaluate the effects of uterine fibroids during pregnancy on obstetrics outcomes. More specifically, to investigate the complication of fibroids associated with pregnancy, during antenatal, Intrapartum and postpartum periods and to evaluate their effect on perinatal outcomes.

### **Material and Methods**

This case-control study was conducted in the Khartoum Hospital, Sudan, during June 2011 and through May 2012 to investigate maternal and perinatal outcomes of uterine fibroid. Cases were pregnant women who have uterine fibroids, diagnosed by ultrasound scan or discovered accidentally during caesarean section. One consecutive pregnant woman who have no uterine fibroids per case acted as control. We included all pregnant women who attended the labour ward, or planned for either normal or operative delivery, in the hospital, during the study period,

and accepted to participate in the study. After taking an Informed consent; basic socio-demographic data such as age, educational level and antenatal attendance, fibroids locations, mode of delivery, perinatal (preterm birth, intrauterine growth restriction, stillbirth, admission to the nursery department) and maternal outcomes (history of miscarriage, delayed to conceive, antepartum haemorrhage, pain necessitated hospital admission, malpresentations, abnormal fetal lie, uterine atony and need for blood transfusion as a result of postpartum haemorrhage) were gathered using standardized questionnaires from all women. The gestational age calculated from the last menstrual period or ultrasound and clinical estimation if last period was not known while the maternal age was defined as age completed in year at time of this study. Data were entered into a computer database and were double-checked before analysis using SPSS version 16.0 (SPSS, Chicago, IL, USA). Means and proportions for the socio-demographic characteristics and outcomes were compared between the 2 groups of the study using the *t* test and  $\chi^2$  tests, respectively. Univariate and multivariate analyses were performed. Uterine fibroid was the dependent variable, while socio-demographic characteristics and maternal and perinatal outcomes were independent variables.  $P < 0.05$  was considered significant.

## **Results**

During the study period there were 104 investigated cases with uterine fibroids and a similar number of control pregnancies without fibroids. Their mean (SD) age, parity and gestational age was 27.6 (6.3), 2.6 (1.7) and 37.6 (1.7) respectively. The majority of these cases were of urban residence (62/104, 59.6%), booked (65/104, 62.5%) and had  $\geq$  secondary education (54/104, 51.9%). On further analysis and with regard to the site of uterine fibroid 52.9% (55/104) of the

women were found having intra-mural fibroid, 28.8% (30/104) having sub-serous fibroid, and 18.3% (19/104) having sub-mucous one. Additionally, we found that 31.7% (33/104) of our studied group have uterine fibroid which were discovered for the first time during this study while 68.3% (71/104) were diagnosed prior to our study. Both groups were similar with respect to age, parity, residence, and educations. The mean (SD) age, parity and gestational age was not significantly different between the cases and controls (104 in each arm), table 1.

### **Maternal and perinatal Data of the cases**

Compared to women without uterine fibroids, patients with uterine fibroids (104 women) 66 (63.4%), 28 (26.9%) and 38 (31.7%) gave history of delay of conception, heavy menstrual cycle and miscarriage respectively. Also in the current study compared with the controls, 72 (69.2%), 20 (19.2%) and 13 (12.5%), 10 (9.6%) and 6 (5.8%) of the cases experienced pain (which necessitated hospital admission), uterine atony, ante-partum haemorrhage, abnormal lie and abnormal presentation respectively. Caesarean section was the mode of delivery in 26 (25%) women of the case group compared to 12 (11.5%) of the control group (Table 2). Among these 26 women the intra-operative blood loss was estimated as increased in 18 (72%) cases. Again among those who developed uterine atony (20(19.2%) cases) 13 (65%) women were transfused with at least two units of blood. With respect to the perinatal outcomes 86 (82.7%) of the cases their pregnancy end with living babies while 15 (14.4%) and 3(2.9%) cases pregnancy end with early neonatal death and stillbirth deliveries respectively. Out of the 104 cases 11 (10.6%), 8 (7.7%) and 4 (3.8%) women their babies were admitted to the Neonatal intensive care nursery (NICN), due to preterm and intrauterine growth restriction (IUGR) respectively Table 2.

### **Obstetric outcome of uterine fibroid**

Using chi-square test and logistic regression analyses there was significant association between delayed to conceive ( $CI= 2.9 - 11.1$ ,  $OR= 5.7$ ,  $P= <0.001$ ), miscarriage ( $CI= 3.7 - 18$ ,  $OR= 26.4$ ,  $P= 0.001$ ), experience of pain during pregnancy necessitating hospital admission ( $CI= 4.1 - 25.7$ ,  $OR= 10.3$ ,  $P= <0.001$ ), antepartum haemorrhage ( $CI= 0.01 - 0.5$ ,  $OR= 0.07$ ,  $P= 0.010$ ), uterine atony ( $CI= 0.02 - 0.56$ ,  $OR= 0.1$ ,  $P= 0.008$ ), need for blood transfusion as a result of uterine atony ( $CI= 0.8 - 6.5$ ,  $OR= 2.2$ ,  $P= 0.032$ ), and uterine fibroids in pregnancy, table 2. Pregnancy with uterine fibroids also had a higher unplanned caesarean section rate ( $CI= 0.1 - 0.8$ ,  $OR= 0.3$ ,  $P= 0.014$ ) but there was no differences in perinatal outcomes (delivery at term, living births, birth weight, and preterm birth. between the two groups of the study, (Table 3, 4).

## Discussion

The findings of this study showed strong association between delayed conception, miscarriage, pain, ante-partum haemorrhage, postpartum haemorrhage and uterine fibroids. However our study failed to demonstrate significant association between uterine fibroids and poor perinatal outcomes. The rate of sub-fertility was significantly higher in the study group than the control group ( $OR=5.7$ ;  $CI=2.9-11.1$ ;  $P=<0.001$ ). In a study comparing pregnancy rates in infertile women after exclusion of male and tubal factors, a significant detrimental effect of fibroids was found (9). Some studies had reported a decrease in pregnancy rates in patients with distorted uterine cavity due to fibroids compared to patients without distorted cavities; again other studies have shown that the presence of sub-mucosal and intramural fibroids result in lower implantation rates in comparison to women without fibroids (10). *Pritts et al.* found that submucosal myomectomy increased pregnancy rates compared to infertile women who did not undergo

myomectomy for their submucous fibroids (OR 2.03, CI 1.08–3.82) (11). Although most pregnancies are unaffected by the presence of uterine fibroids, the large submucosal and retro-placental fibroids seem to impact a greater risk for complications (11). This might explain the association between the miscarriage, ante-partum haemorrhage, pain and uterine fibroid in our study. Uterine fibroids may cause a significant amount of pain during pregnancy for some patients if they undergo red degeneration. It is reported that 5–15% of women with fibroids will require hospitalization during pregnancy for pain control, with the risk increasing for fibroids larger than 5cm (12). Concerning lie and presentations, only 9.6% and 5.8% of our cases have abnormal lie and presentations respectively.

In the literature there is still debate regarding the certainty of fibroid association with adverse obstetric outcomes. Most studies suggest that placental abruption, malpresentations and breech presentation, and postpartum haemorrhage are complications of fibroids in pregnancy (13, 14). In our study, the impact of fibroids on the postpartum period was similar to other studies, where significant correlation between the fibroids and uterine atony was found (14). Increased intra-operative blood loss associated with uterine fibroid in this study might be due to suboptimal uterine contractions following delivery. In the current study it was obviously noted that there was increase in Caesarean section rates with uterine fibroids; these results is in line with what is in the literature where a recent review of the literature showed a significantly increased rate of caesarean section in women with uterine fibroids compared to those without, (48.8% versus 13.3%) (7). With respect to the perinatal outcome associated with fibroids, it is worth mentioning that there was no difference in rates of term and premature deliveries between the study group and the control group. These results were inconsistent with data from literature where increased risk of premature birth and intramural fibroids were reported (15). The location of uterine



fibroids in relation to placental site may be an important determinant factor. After analysing the different proposed variable, it has been observed that there were no significant differences in perinatal outcomes (living babies, IUGR, admission to NICU). Some studies have shown that neonatal birth weight at delivery was lower in women with fibroids compared to women without fibroids, although the likelihood of fetal growth restriction was similar among those with and without fibroids.(16) The impact of fibroids volume and number on pregnancy course and outcome could not be estimated clearly in this study because of difficulties surrounding proper measurement of fibroids in late pregnancy. However it has been shown in cohort studies that the majority of women with fibroids have only one fibroid on ultrasound imaging, but up to 22% will have 4 or more fibroids. In the studies by both De Vivo et al and Stout et al (2,1) it has been observed that the peripartum outcomes did not differ for women with one or multiple fibroids. The location of the fibroid also did not influence the obstetric outcomes.(17)(2) The likelihood of breech presentation and of caesarean delivery was similar regardless of whether the fibroid was in lower or upper uterine segment. Stout et al and Qidwai et al [18] noted that the rate of breech presentation was greater if the mean uterine fibroid volume was  $\geq 100$  mm.(1) In addition, he also reported that the complications did not differ among cohorts whether the fibroid and placenta were in the same location or in different locations.(19)

In their evaluation of more than 15,000 women with singleton pregnancy who underwent sonographic examination in the second trimester, Qidwai et al (18) noted that 10% of those with fibroids had tumors that measured at least 10 cm.(2) For women with fibroids  $\geq 10$  cm, there was an increased rate of malpresentations but no differences in preterm birth, PPRM, placenta praevia, placental abruption, caesarean delivery, or postpartum haemorrhage (compared to those with fibroids  $< 10$  cm). Other investigators have reported an association with greater risk of

adverse obstetrical outcomes based on the size of fibroids (increased if > 5 cm).(19) This fact might explain the discrepancy between our results which did not include measuring fibroid sizes and other reports which demonstrated significant association between the uterine fibroids and pregnancy outcomes.

### **Limitations**

Limitations of this study is partly due to some of the fibroids with pregnancy might be missed during routine antenatal ultrasound examination, possible due to difficulty to identify uterine fibroids during pregnancy. Also size of fibroids and proximity to the placental implantation were not yet determined.

### **Conclusion**

Uterine fibroids are associated with an increased risk of miscarriage, pain, ante-partum haemorrhage and uterine atony. Higher proportion of women with uterine fibroids delivers by caesarean section in comparison with the control group. There are no significant differences in perinatal outcomes between the two groups of study. Rate of sub-fertility is significantly higher in the group with fibroids than the control group, probably due to distorted uterine cavity or/and presence of sub-mucosal and intramural fibroids resulting in lower implantation rates. Thus preconceptual counselling and early diagnosis by ultrasound are important factors regarding anticipating pregnancy, childbirth and postpartum complications

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**Table 1 Comparison of women with uterine fibroids and those without fibroids, Khartoum teaching hospital, Sudan**

Variable	With fibroids (N=104)	Without fibroids (N=104)	P
Age, year	27.6 (6.3)	26.9 (6.4)	0.262
Parity	2.6 (1.7)	3 (1.8)	0.124
Gestational age, week	37.6 (1.7)	38.7 (1.5)	0.117
Booked, yes	65 (62.5)	55 (53.4)	0.118
Urban residence	62 (59.6)	64(61.5)	0.444
Education, ≥ secondary level	54 (51.9)	56 (53.8)	0.445

Data was shown as mean (SD) and number (%)as applicable.

**Table 2 Comparison of obstetric outcomes between pregnant women with uterine fibroids and those without fibroids in Khartoum teaching hospital, Sudan using *chi-square test*.**

Variables	With Fibroids (N=104)	Without fibroids(N=104)	<i>P</i>
Miscarriage	38(31.7%)	5 (4.8)	0.000
Delayed to conceive	66(63.4%)	15(14.4)	0.000
APH	13(12.5)	14(13.5)	0.500
Pain	72(69.2)	18(17.3)	0.000
Abnormal presentation	6(5.8)	17(16.3)	0.013
Abnormal lie	10(9.6%)	8 (7.6)	0.212
Mode of delivery, C/S	26(25)	12 (11.5)	0.009
Uterine atony	20(19.2)	7(6.7)	0.006

Preterm birth	8 (7.7)	7 (6.7)	0.500
Stillbirth	3 (2.9)	3 (2.9)	0.659
IUGR	4 (3.8)	6 (5.8)	0.374
Nursery admission	11 (10.6)	8 (7.7)	0.316

Data are shown as number (%) as applicable. Abbreviations: APH=ante partum haemorrhage; C/S=caesarean section; IUGR=intra-uterine growth restriction.

**Table 3: Maternal outcomes of uterine fibroid in pregnancy in Khartoum, Sudan using univariate and multivariate analyses.**

Variable	Univariate analyses			Multivariate analyses		
	OR	95% CI	P-value	OR	95% CI	P-value
Miscarriage	9.2	3.4-24.7	<0.001	26.4	3.7-18	0.001
Delayed to conceive	6.6	1.7-15.6	0.001	5.7	2.9-11.1	<0.001
Pain	10.7	5.5-20.7	<0.001	10.3	4.1-25.7	<0.001
Abnormal presentation	0.8	0.2-4.2	0.921	0.7	0.6-6.8	0.765
Abnormal lie	2.4	1.5-4	0.001	1.3	0.7-2.4	0.221
APH	0.9	0.4-2	0.837	0.07	0.01-0.5	0.010

Mode of delivery, C/S	0.4	0.1-0.9	0.012	0.3	0.1-0.8	0.014
Uterine atony	3.2	1.3-8.1	0.010	0.1	0.02-0.5	0.008
Intra-operative blood loss	4.5	0.4-37.1	0.252	11.2	0.3-25.9	0.840
Blood transfusion, yes	2.8	0.9-8.2	0.057	2.2	0.8-6.5	0.032

Abbreviations: OR, Odds Ratio; CI, confidence interval; APH, antepartum haemorrhage; C/S, caesarean section.

**Table 4: Perinatal outcomes of uterine fibroid in Khartoum, Sudan using univariate and multivariate analyses.**

Variable	Univariate analyses			Multivariate analyses		
	OR	95% CI	<i>P</i> -value	OR	95% CI	<i>P</i> -value
Living babies	2.9	1.4-4.2	0.837	1.5	0.8-2.5	0.400
IUGR	0.9	0.9-1.0	0.110	0.9	0.9-1.0	0.211



Stillbirth	1.1	0.4-2.4	0.100	0.4	0.1-1.5	0.153
Preterm birth	1.0	0.9-1.0	0.700	0.9	0.9-1.90	0.210
NICN admission	1.9	0.9-2.3	0.061	1.2	0.8-2.0	0.301

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Abbreviations: OR, Odds Ratio; CI, confidence interval; IUGR, intrauterine growth restriction;  
NICN, Neonatal intensive care nursery.