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Original Research Article

FIBROID COMPLICATING PREGNANCY - MATERNAL AND FETAL OUTCOME

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Abstract

Background: Uterine fibroids, or leiomyomas, are benign smooth muscle tumours found in 20-50% of women of reproductive age. Risk factors include nulliparity, family history, polycystic ovarian syndrome, diabetes, hypertension, obesity, and a red meat diet. Fibroids can cause infertility or pregnancy loss and the number of fibroids increases the risk of complications. This study aimed to determine the association between the number of fibroids and adverse pregnancy and foetal outcomes. **Material and Methods:** This prospective observational study included 60 patients at the Department of Obstetrics and Gynecology, India Institute of Obstetrics and Gynaecology, Chennai, Tamil Nadu between February 2019 and April 2020. Clinical examination of every patient was performed, as well as obstetric and pelvic examinations. Ultrasonography was performed at successive visits to evaluate changes in the number and size of fibroids and any associated complications. **Results:** There was a significant difference in the incidence of PPH complications between the single- and multiple-fibroid groups (p=0.044). The number of fibroids affects postpartum haemorrhage complications. There was no significant difference in foetal outcomes between the single fibroid and multiple fibroid groups (p>0.05). Within the single fibroid group, patients predominantly had low birth weight (32.61%). In the multiple fibroid group, patients predominantly had birth asphyxia foetal outcome status (21.43%). The number of fibroids did not affect the foetal outcomes. **Conclusion:** The risk of postpartum haemorrhage increased with the number of fibroids present. This study serves as a hypothesis-proving investigation, and its results have a high clinical significance.

INTRODUCTION

Uterine fibroids are also known as leiomyomas. They are benign smooth muscle tumours of the uterus. Fibroids are found in approximately 20–50% of women of reproductive age. The prevalence of fibroids ranges from 0.1% to 12.5%. As the maternal age at pregnancy increases, the incidence of fibroids increases accordingly, with the peak incidence occurring between 35 and 49 years of age. Fibroids less than 5 cm in diameter tend to remain stable or decrease in size, whereas larger fibroids (>5 cm) tend to grow during pregnancy.

Many women are asymptomatic; therefore, a large percentage of fibroids are undetected and undiagnosed. This might undermine the actual incidence statistics. Risk factors for fibroids include nulliparity, family history, polycystic ovarian syndrome, diabetes, hypertension, obesity, and a diet higher in red meat and lower in green vegetables, fruits, and dairy.

Fibroids normally do not interfere with the process of pregnancy. However, they can cause infertility or pregnancy loss, particularly in submucosal fibroids. The risk of adverse events during pregnancy increases with the size, location, and number of fibroids. Fibroids may also increase the risk of certain ante-, intra-, and postpartum-related complications, such as placental abruption, antepartum haemorrhage (APH), acute abdomen, preterm labour, foetal disproportion, malposition of the foetus, retained placenta, red degeneration, dysfunctional labour, postpartum haemorrhage (PPH), retained products of conception, and intrauterine growth restriction (FGR). These complications are more commonly observed in large, multiple, and submucosal retroplacental fibroids.

Owing to the high incidence of these adverse events during pregnancy with fibroids, it has been a topic

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of research for many years. However, there is a paucity of literature on the Indian population, especially the South Indian population, relating to the effects of the number of fibroids on pregnancy and child outcomes. In this prospective observational study, we assessed the pregnancy and foetal outcomes in patients with multiple uterine fibroids and presented the demographic, clinical, and obstetric data and perinatal outcomes of a tertiary-level hospital in Chennai, Tamil Nadu.

Aim

This study aimed to determine the association between the number of fibroids and adverse pregnancy and foetal outcomes.

MATERIALS AND METHODS

This prospective observational study included 60 patients from the Department of Obstetrics and Gynecology, India Institute of Obstetrics and Gynaecology, Chennai, between February 2019 and April 2020. The study was approved by the Institutional Ethics Committee before initiation, and informed consent was obtained from all patients.

Inclusion Criteria

Patients with a singleton pregnancy, gestational age of 24-42 weeks at the time of delivery, availability of documented records, and at least one leiomyoma noted on routine first- or second-trimester ultrasound examinations were included.

Exclusion Criteria

Patients with pathological conditions (chronic hypertension, gestational diabetes or pre-existing diabetes mellitus, uterine anomalies, or foetal malformations), multiple pregnancies, unbooked pregnancies, and contraindications for normal vaginal delivery, such as two previous caesarean deliveries or placenta previa, who did not meet the inclusion criteria were excluded.

Methods

Detailed history was obtained as per the proforma, obstetrical, medical, and surgical history. Clinical examination of every patient was performed, as well as obstetric and pelvic examinations. Ultrasonography was performed at successive visits to evaluate changes in the number and size of fibroids and any associated complications. Other routine investigations were performed, including complete blood count, haemoglobin, total leukocyte count, platelet count, liver function tests, and sugar-random, fasting, and postprandial blood tests. A definite history of diabetes with records of treatment or fasting plasma glucose ≥ 126 mg/dl, two-hour post-load glucose ≥ 200 mg/dl, blood urea, serum creatinine, serum uric acid, serum electrolytes, urine routine analysis, ECG - 12 lead ECG, and USG abdomen.

The outcome variables were fibroid characteristics, complications, mode of delivery**,** indication for LSCS**,** Preterm delivery**,** birth weight**,** birth asphyxia**,** NICU admission**,** and abortion status.

Statistical Analysis

Descriptive statistics were reported as mean values and percentages. Suitable statistical tests were performed for comparison. Continuous variables were analysed using unpaired t-tests. Categorical variables were analysed using the chi-squared test and Fisher's exact test. Statistical significance was set at $p<0.05$. The data analysis was done with the statistical software SPSS Version 16. Microsoft Excel 2007 was used to generate the charts.

RESULTS

Among the women with uterine fibroids, 46 (76.67%) had a single fibroid, whereas 14 (23.33%) had multiple fibroids. There were no significant differences in age, type of conception, history of abortion, gestational age at birth, time of diagnosis, or birth weight between the single and multiple fibroid groups (p=0.983, p=0.12, p=0.234, p=0.265, p=0.962, p=0.923). There was a higher incidence of multiple fibroids in multigravidas than in primigravidas. There was a significant difference in parity between the single and multiple fibroids groups (p=0.014). [Table 1]

There was no significant difference in the mode of delivery and indications for LSCS between the single- and multiple-fibroid groups (p=0.229, p=0.342). Regarding the mode of delivery, most of the patients had LSCS in both the single fibroid group 20 (48.78%) and the multiple fibroid group 7 (63.64%). Regarding the indications for LSCS, within the single fibroid group, most belonged to malpresentation 6 (31.58%), whereas in the multiple fibroid group, many belonged to post-caesarean pregnancy 3 (42.86%). The number of fibroids did not affect the mode of delivery or the indications for LSCS. [Table 2]

There was a significant difference in the incidence of PPH complications between the single- and multiple-fibroid groups (p=0.044). Within the single fibroid group, the patients were predominantly asymptomatic (23.91%). In the multiple fibroid group, the patients predominantly had PPH complications (28.57%). The number of fibroids affects postpartum haemorrhage complications. There was no significant difference in foetal outcomes between the single fibroid and multiple fibroid groups (p>0.05). Within the single fibroid group, patients predominantly had low birth weight (32.61%). In the multiple fibroid group, patients predominantly had birth asphyxia foetal outcome status (21.43%). The number of fibroids did not affect foetal outcomes. [Table 3]

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Table 1: Demographic details of the study groups

		Single Fibroid Group (%)	Multiple Fibroids Group (%)	P value
Study Groups		46 (76.67)	14 (23.33)	
Age (years)	≤ 20	3 (6.52)	0	0.983
	21-25	16 (34.78)	5 (35.71)	
	26-30	23 (50)	8 (57.14)	
	31-35	3 (6.52)	1 (7.14)	
	36-40	1 (2.17)	0	
Parity	Primigravida	19 (41.3)	1 (7.14)	0.014
	Multigravida	27 (58.7)	13 (92.86)	
Type of conception	Spontaneous	31 (67.39)	12 (85.71)	0.12
	Ovulation Induction	10 (21.74)	1 (7.14)	
	IVF	5 (10.87)	1 (7.14)	
History of abortion	Yes	18 (39.13)	8 (57.14	0.234
	No	28 (60.87)	6 (42.86)	
Gestational age at birth (weeks)	≤ 28	1 (3.57)	0	0.265
	29-32	1 (3.57)	0	
	33-36	5 (17.86)	1 (16.67)	
	37-40	21 (75)	5 (83.33)	
Time of diagnosis (weeks)	≤ 12	8 (17.39)	3 (21.43)	0.962
	13-20	11(23.91)	2 (14.29)	
	21-28	3 (6.52)	1 (7.14)	
	29-36	3 (6.52)	1 (7.14)	
	Before pregnancy	21 (45.65)	7 (50)	
Birth weight (kg)	≤ 2	1 (2.44)	0	0.923
	2.01-2.50	15 (36.59)	3 (27.27)	
	2.51-3.00	19 (46.34)	7 (63.64)	
	3.01-3.50	6 (14.63)	1 (9.09)	

Table 2: Mode of delivery, Indications for LSCS

		Single Fibroid Group (%)	Multiple Fibroids Group (%)	P value
Mode of delivery	SVD	13 (31.71)	3 (27.27)	0.229
	Outlet forceps	3 (7.32)	1 (9.09)	
	Vacuum	4 (6.76)	0	
	LSCS	20 (48.78)	7 (63.64)	
	Caesarean hysterectomy	1 (2.44)	0	
Indications for LSCS	Malpresentation	6 (31.58)	1 (14.29)	0.342
	Post caesarean pregnancy	5 (26.32)	3 (42.86)	
	Abruptio placentae	1 (5.26)	1 (14.29)	
	PROM	3 (15.79)	1 (14.29)	
	Uterine inertia	4 (21.05)	1 (14.29)	

Table 3: Number of fibroids versus complications and foetal outcome

		Single Fibroid Group (%)	Multiple Fibroids Group (%)	P value
Number of fibroids versus complications	Asymptomatic	11 (23.91)	1 (7.14)	0.133
	Abortion	5 (10.87)	3 (21.43)	0.195
	Pain abdomen	8 (17.39)	2 (14.29)	0.315
	Threatened PTL	7 (15.22)	1 (7.14)	0.293
	Anaemia	10 (21.74)	2 (14.29)	0.265
	FGR	10 (21.74)	1 (7.14)	0.167
	APH	1 (2.17)	1 (7.14)	0.364
	PPH	4 (8.70)	4 (28.57)	0.044
Number of fibroids versus foetal outcome	Preterm	6 (13.04)	1 (7.14)	0.339
	Birth asphyxia	9 (19.57)	3 (21.43)	0.287
	NICU admission	5 (10.87)	1 (7.14)	0.383
	Low birth weight	15 (32.61)	2 (14.29	0.12

DISCUSSION

Age, type of conception, history of abortion, gestational age at birth, time of diagnosis, complications except PPH, foetal outcomes, birth weight, mode of delivery, and indications for LSCS status study variables failed to show any significant differences and effects on outcomes when data gathered in our study were analysed. The same view was echoed by Hend et al, Zhao et al., Banjar et al., Egbe et al., Ortiz et al., Coronado et al., and Saleh et al.[1-7]

The incidence of multigravida parity was significantly lower in the single fibroid group than in the multiple fibroid group by 34.16 percentage points (37% lower). The results obtained in our study were consistent with those of Singh et al., who reported a higher rate of multiple pregnancies (60% vs. 46%) in women with multiple fibroids and single fibroids. Based on the results obtained in this study, it can be assumed that multiple fibroids are less common during the first pregnancy than during multiple pregnancies. This may be because multiple fibroids may distort the uterine architecture more

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than single fibroids and interfere with myometrial contractions leading to uterine atony and postpartum haemorrhage.[8]

The incidence of PPH as a complication was significantly lower in the single-fibroid study group than in the multiple-fibroid study group by 19.88 percentage points (70% lower). The results obtained in our study were consistent with those of Lam et al., who reported a higher rate of postpartum haemorrhage (22% vs. 11%; p=0.03) in patients with multiple fibroids than in those with single fibroids. Based on the results obtained in this study, it can be assumed that multiple fibroids contribute significantly more to the occurrence of PPH, which in turn results in poor pregnancy outcomes. This may be because the levels of reproductive hormonal imbalances in multiple pregnancies, especially oestrogen levels, lead to fibroid development and growth in size and number. Oestrogen-related pathways, fibroid growth factor-induced pathways, and the interaction between oestrogen stimulation and progesterone responsiveness may play a big role.[9]

CONCLUSION

Based on the results obtained in our study, we can safely conclude that age, type of conception, history of abortion, gestational age at birth, time of diagnosis, complications (except postpartum haemorrhage), foetal outcomes, birth weight, mode of delivery, and indications for LSCS did not have a statistically significant effect when comparing fibroid-complicating pregnancies with maternal and foetal outcomes. Multiparity has been identified as an independent risk factor for multiple fibroids. The risk of postpartum haemorrhage increases with the number of fibroids present. This study serves as a hypothesis-proving investigation, and its results have a high clinical significance. These findings will help bridge the gaps in research regarding how multiple fibroids complicate pregnancies, leading to adverse maternal and foetal outcomes.

Limitations

This study had several limitations, including the small sample size, which restricted the potential for robust statistical analysis. The inability to employ research designs such as case-control or cohort studies due to limited time and resources further constrained the scope of the study. The lack of a random sampling technique may hinder the generalisation of the results to a broader community. The enrolment, screening, and recruitment processes were not comprehensive, introducing the possibility of recruitment bias. The study also suffered from poor financial support and was limited to a duration of only one year.

Recommendations

Larger and meticulously designed studies with larger sample sizes from multiple centres and longer follow-up periods are required for more elaborate statistical analyses and better clinical decision-making. Further studies investigating this issue should be performed to make informed recommendations regarding the preferred mode of management among pregnant women with multiple fibroids. We propose that multiparity is an independent risk factor for poor maternal and foetal outcomes in pregnant women with multiple fibroids. This identification would enable appropriate preventive measures to be taken during the preconception, antenatal, and intrapartum periods to avoid any adverse outcomes.

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