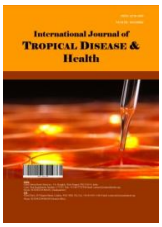

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Predictors of Spontaneous Conception Following Myomectomy among Women with Infertility at Federal Medical Centre Yenagoa, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

- **Background:** Uterine fibroid or leiomyoma (myoma) is the commonest uterine neoplasm in women, and it has been associated with infertility. Though it's not regarded as a direct cause, surgical removal (myomectomy) has been reported to increase the spontaneous conception rate in women with infertility.
- **Objective:** The objective of this study was to determine the factors associated with conception after myomectomy in women with infertility. It would determine the pregnancy rate, demographic, and surgical factors (pre and postoperative factors).
- **Materials and Methods:** This was a retrospective observational study of 107 women who had myomectomy during the study period, out of these, 68 were done for infertility. The case notes of these women were retrieved, and information related to demographic factors obtained was: maternal age, parity, address, tribe, educational level, and occupation. The

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preoperative surgical factors obtained were previous history of myomectomy, indication for myomectomy, the size, number and location of myomas, and the caliber of the surgeon. Postoperative surgical data collected include conception, interval between myomectomy and conception, pregnancy outcome, mode of delivery, and fetal sex and birth weight. Categorical variables were compared with chi square and odds ratio, and the degree of association for quantitative variables was determined using Pearson's correlation coefficient. Predictor variables were determined using simple logistic regression, and multivariate analysis.

- **Results:** The infertility rate among the women who had myomectomy was 63.6%, the conception rate was 14.7%, and the mean myomectomy to pregnancy interval was 9.20 ± 1.24 months. The factors that favor conception were: younger women P = 0.003, uterine size ≤ 16 weeks odds ratio = 3.50(0.14, 84.20), high parity (p = 0.002), solitary fibroid odd ratio = 2.65(0.44, 16.04), tertiary education P = 0.0001 and surgery by consultants P = 0.004. Others were absence of submucous myomas, and pelvic pathology at laparotomy. Using multivariate analysis, the most significant predictors for conception were age and parity, accounting for 10.7%, and all the factors put together could only explain 36.5%.
- **Conclusion:** The conception rate following myomectomy in Yenagoa was relatively low, and the most important predictors were maternal age and parity. The bulk of the factors (65.5%) that determine conception are outside the scope of our study; these could be male factor infertility, factors within the tubal lumen, unidentified uterine synechia, and ovarian failure.

Keywords: Uterine fibroid; infertility; myomectomy; conception.

1. INTRODUCTION

Uterine fibroids, also called uterine leiomyoma (or myoma) are the commonest tumors of the uterine corpus [1]. Reported prevalence from hospital based studied in Nigeria are 6.83% in South Western Nigeria [2], and 24.7% of major gynecological operations in Kano [3]. It has been reported that majority of women with fibroids are asymptomatic, and are discovered incidentally on radiological evaluation. However, about 20 -50% presents with symptoms such as infertility, menorrhagia and pelvic mass [4].

Some of the most common predisposing factors are low parity, race and advanced maternal age. Previous studies in Nigeria have identified low or nulliparity as a strong risk factor, accounting for 88.5% of the cases in Makurdi, [5] 62% in Ilorin, [6] and 75.4% in Uyo [7]. Another important risk factor is race; in a study in Kaiser Permanente Washington, the prevalence of fibroid was found to be higher (18.5%) among black women than any other race in the US [8].

Uterine fibroids have been reported to occur at an earlier age in black women [9]. In addition, the growth rate was reported to be higher (after 35 years) in blacks women than whites with p = 0.05 [10]. In a study in Cleveland USA, women who had more than 6 myomas removed during myomectomy were more likely to be Africans than any other race with p = 0.032 [11].

The relationship between age and parity has long been established, and it tends to follow a linear trend. Findings from a study revealed that fibroids occur in 60% of women before the age of 40, and 80% before 50 years. [9]

The decision to operate women with uterine fibroid largely depends of several factors, which include their desire to get pregnant, severity of symptoms, parity and age. [12,9] Evidence from a study in Ilorin, Nigeria revealed that infertility (78.4%), menstrual disturbances (70.5%) and abdominal mass (52%) were the most common presenting symptoms. [6] Uterine fibroid is not a prominent cause of infertility, and it is believed to contribute as low as 2.4%. [13] It is widely regarded as associated symptom.

There are various treatment options for uterine fibroid, but for women who wish to conserve fertility, myomectomy is the treatment of choice. [1] Laparoscopic and hysteroscopic myomectomy are highly preferred. However open myomectomy is still widely practiced as first line management in developing countries, where laparoscopy equipment or expertise are not available.

The beneficial effects of myomectomy as a solution to infertility (according to some authorities) have not been clearly proven. Evidence from Cochrane study on surgical treatment of fibroids for subfertility reported that

there is limited evidence to prove the role of myomectomy on infertility [14]. According to the Practice Committee of the American Society for Reproductive Medicine, there is insufficient evidence to prove that myomectomy for intramural and submucous fibroids improves pregnancy outcome, except for hysteroscopic myomectomy for cavity distorting myomas [15].

However, experience from gynaecology units revealed that following myomectomy, quite a significant number of women gets pregnant. Evidence from a previous study revealed that pregnancy rate was increased from 24% before myomectomy to 43% after surgery [16]. In a similar study in Dhaka, Bangladesh, a pregnancy rate of 35% was reported, of which 42.9% occurred between 1–2 years following myomectomy [17]. Other studies in Nigeria reported pregnancy rates of 43.9% in Ile‑Ife, [18] and 33% in Orlu [19]. A study on the impact of myomectomy on pregnancy outcome at Jessop Hospital for Women, Sheffield, UK, reported a pregnancy rate of 57%, with reduction in pregnancy loss from 60% prior to myomectomy to 24% after myomectomy [20].

In Sub-Saharan Africa, the rate of infertility is very high because of the high rate of sexually transmitted infections and its complications [21]. Findings from a multicentre study in Nigeria reported infertility rates of 59.4% in Ile-Ife, 47.7% in Iiesa, 54.8% in Oshogbo, and 44.2% in Ikire [22]. The affected women seek treatment, often in many centers with varying degree of results. Myomectomy is the most frequently employed treatment options in our environment for women with uterine fibroid and infertility, even if there is no evidence that the fibroid is the cause. The intent of this study is to determine the factors that determine successful myomectomy in Yenagoa, Nigeria, using pregnancy as a yardstick.

2. OBJECTIVE

The objective of this study is to determine the factors associated with conception after myomectomy in women with infertility. It would determine the pregnancy rate, demographic, and surgical factors, which include preoperative factors and postoperative outcome measures. It would also determine the fetal demographic characteristics such as birth weight and fetal sex.

3. MATERIALS AND METHODS

3.1 Study Site

The study was carried out in the department of Obstetrics and Gynaecology, Federal Medical Centre (FMC) Yenagoa; the hospital is located in Yenagoa, the capital of Bayelsa state, Southern Nigeria. It serves as a referral center; it receives patients from all parts of Bayelsa State, including primary and secondary health care facilities. It also receives patients from parts of our neighboring states like Rivers, and Delta States.

3.2 Study Design

It was a retrospective observational study of 68 women who had myomectomy for infertility at FMC Yenagoa, from January 2015 to January 2020. Excluded from this study were women who had myomectomy for other reasons, such as abdominal mass, menorrhagia, irregular vaginal bleeding or pelvic pain. Also excluded were women who did not conceive spontaneously, but by assisted reproduction after myomectomy.

3.3 Data Collection

Data was retrieved from the registry of the gynaecology theatre, a total of 107 women who had myomectomy during the study period were retrieved. Out of these, 68 women whose indication for myomectomy was infertility were identified, and data relevant to this study was obtained, in compliance with the rules and regulations of the ethical committee of Federal Medical Centre Yenagoa. Information related to demographic factors obtained was: maternal age, parity, tribe, educational level, occupation, and address: categorized as urban dwellers (state capital), semi urban (local government headquarters) and rural dwellers. The preoperative surgical factors were previous history of myomectomy, indication for myomectomy, number and location of myomas, and the caliber of the surgeon. The size of fibroid was obtained by abdominal palpation for uterine size; it was measured with a tape using the symphysis pubis as a reference point. The uterine size in centimeters was presented in weeks, in concordance with that of a corresponding pregnant uterus. Postoperative surgical data collected include conception, interval between myomectomy and conception, pregnancy outcome, and mode of delivery. Fetal

demographic factors were birth weight and fetal sex.

Data on treatment given to these women outside myomectomy was not collected because it was beyond the scope of this study.

3.4 Data Analysis

Data collected from each subject was entered into SPSS version 25 for windows, and EPI info version 7 software. Categorical variables were compared with chi square and odds ratio, and the degree of association for quantitative variables was determined using Pearson's correlation coefficient. Predictor variables were determined using simple logistic regression, and multivariate analysis. Confidence interval was set at 95%, and statistical significance was set at p value of < 0.05.

4. RESULTS

With respect to Table 1, the mean maternal age was 33.34 ± 4.06 years, and the mean parity was Para 0.47 ± 0.2. The women were mostly from Ijaw tribe (where the hospital is located), and nulliparity predominates. Majority of the women 35(52.9%) had tertiary education, and they were predominantly urban dwellers.

With respect to Table 2, just a handful of the women (5.9%) had myomectomy in the past, and majority of the myomas (35.3%) were of 21–26 weeks uterine size, however, the mean uterine size was 20.96 ± 4.6 weeks.

Table 1. Maternal demographic factors

Variable	Number (n = 68)	Percentage
Maternal age (in years)		
< 25	-	-
25.0 - 29.9	12	17.5
30.0 - 34.9	30	44.1
35.0 - 39.0	21	30.9
≥ 40	5	7.5
Party		
Para 0	47	69.1
Para 1	12	17.6
Para 2	7	10.4
Para 3	2	2.9
Tribe		
Ijaw	50	73.5
Igbo	14	20.7
Yoruba	2	2.9
Other tribes	2	2.9
Religion		
Christian	64	94.1
Muslim	4	5.9
Educational level		
Non formal	-	-
Primary	4	5.9
Secondary	28	41.2
Tertiary	36	52.9
Occupation		
Housewife	19	27.9
Civil servant	34	35.5
Company staff	5	7.5
Self employed	15	22.1
Student	5	7.4
Address		
Urban	61	89.7
Semi urban	5	7.4
Rural	2	2.9

Based on ultrasound scan evaluation, a great majority (92.2%) were multiple fibroids, and 11.8% were submucous. As much as 41.2% of the myomectomies were done by consultants, and the most consistent coexisting finding at laparotomy (14.5%) was bilateral hydrosalpinx.

A total of 107 myomectomies were done during the study period, 68 of these were done for infertility, giving a myomectomy rate among infertile women of 63.6%. Out of these, 10 women got pregnant spontaneously, giving a conception rate of 14.7%. Two of these women (20%) had early first trimester miscarriage, and the remaining 8 women delivered live babies at term, giving a live birth rate of 80%. The mean myomectomy to pregnancy interval was 9.2 ± 1.24 months. The caesarean section rate among the women was 40%. Four women (5.8%) who got pregnant by assisted reproduction were excluded, because it was outside the scope of this study.

Table 2. Pre and post operative factors

Variable	Number (n = 68)	Percentage
History of previous myomectomy		
No previous myomectomy	64	94.1
One previous myomectomy	4	5.9
2 previous myomectomies	-	-
Total	68	100
Size of myomas (Uterine size by abdominal palpation)		
12 weeks and below	1	1.5
13 – 16 weeks	13	19.1
17 – 20 weeks	22	33.8
21 – 26 weeks	24	35.3
Above 26 weeks	8	11.8
Total	68	100
Number of myomas (by ultrasound scan)		
Single	5	7.4
Multiple	63	92.6
Total	68	100
Location of myomas (by ultrasound scan)		
Predominantly subserous	7	10.3
Predominantly intramural	47	69.1
Predominantly submucous	8	11.8
No Predominant location specified	6	8.8
Total	68	100
Indication for myomectomy		
Infertility alone	12	17.6
Infertility with abdominal mass	33	48.5
Infertility with menorrhagia	12	17.6
Infertility with intermittent abdominal pain	7	10.3
Total	68	100
Rank of the surgeon		
Consultant	28	41.2
Senior resident	15	22.1
Junior resident	25	36.8
Findings at laparotomy (probable risk factor for infertility)		
No associated finding	41	60.3
Unilateral hydrosalpinx	8	11.8
Bilateral hydrosalpinx	10	14.5
Polycystic ovarian syndrome (PCOS)	5	7.6

Endometriosis	2	2.9
Gross pelvic adhesions	2	2.9
Gross uterine abnormality	-	-
Total	68	100
Pregnancy after myomectomy		
No pregnancy	54	79.4
Spontaneous conception	10	14.7
Assisted conception	4	5.8%
Total	68	100
Confirmation of early pregnancy		
By ultrasound scan alone	5	50.0
Pregnancy test alone	1	10.0
Pregnancy test and ultrasound scan	4	40.0
Total	10	100
Myomectomy to pregnancy interval		
Less than 12 months	6	60.0
12 – 24 months	3	30.0
> 24 months	1	10.0
Total	10	100
Fetal outcome		
Spontaneous miscarriage	2	20.0
Delivery of a live baby	8	80.0
Still birth	-	-
Total	10	100
Mode of delivery		
Spontaneous vaginal delivery	5	50.0
Caesarean section	4	40.0
Vacuum extraction	1	10.0
Forceps delivery	-	-
Total	10	100
Fetal sex		
Male	3	37.6
Female	5	62.5
Total	10	100

With reference to Table 3, the conception rate was higher among younger women aged 25.0–29.9 years, compared to women of 40 years and above, odds ratio = 0.02(0.00, 0.72), P = 0.003.

The pregnancy rate was higher among women with high parity (Para 2), when compared to nulliparous women (Para 0), odd ratio = 0.09(0.02, 0.52), P = 0.002.

Low educational background does not seem to favor conception following myomectomy; the conception rate was higher among women who attained tertiary education, odd ratio = 0.04(0.00, 0.50), P = 0.001. With respect to occupation, there was no difference in pregnancy rate between unemployed women (house wife) and civil servants, P = 0. 83, and company staff P = 0.56. Similarly, living in an urban or rural environment had no influence on the pregnancy rate, odd ratio = 0.17(0.01, 3.02), P = 0.17.

A history of previous myomectomy seems to be a strong risk factor as none of those who had one or 2 previous myomectomy got pregnant. Evidence from this study indicates that the size of the fibroids have significant influence on the rate of conception, as women whose fibroids were below 13–16 weeks were 3 times more likely to get pregnant, when compared to 17 – 20 weeks size.

The location of the myomas also has significant influence on conception rate, none of the women whose myomectomies were done for submucous fibroid got pregnant, and women with intramural myomas were twice less likely to conceive than those with subserous myomas, odd ratio = 2.29(0.37,14.19).

Table 3. Association between demographic factors, surgical factors and conception rate

Variable	No pregnancy	Pregnancy	Total	Odds ratio	P value
Maternal age (in years)					
<25	-	-	-		
25.0 - 29.9	11(91.7)	1(8.3)	12(100		
30.0 - 34.9	28(93.3)	2(6.7)	30(100)	0.02(0.00, 0.72	0.003
35.0 - 39.0	15(71.40	6(28.6)	21(100)	0.23(0.02. 2.17)	0.17
≥ 40	4(80.0)	1(20.0)	5(100		
Total	58(85.3)	10(14.7)	68(100)		
Parity					
Para 0	42(89.4)	5(10.6)	47(100)		
Para 1	11(91.7)	1(8.3)	12(100)		
Para 2	3(42.9)	4(57.1)	7(100)	0.09(0.02, 0.52)	0.002
Para 3	2(100)	-	2(100)		
Total	58(85.3)	10(14.7)	68(100)		
Educational level					
Non formal	-	-	-		
Primary	3(75.0)	1(20)	4(100)		
Secondary	23(75.0)	5(17.9)	28(100)		
Tertiary	32(88.9)	4(11.1)	36(100)	0.04(0.00, 0.50)	0.001
Total	58(85.3)	10(14.7)	68(100)		
Occupation					
House wife	17(89.5)	2(10.5)	19(100)		
Civil servant	19(79.2)	5(20.8)	24(100)	0.45(0.08, 2.61)	0.83
Company staff	4(80.0)	1(20.0)	5(100)	0.47(0.03, 6.57)	0.56
Self employed	13(86.7)	2(13.3)	15(100)		
Student	5(100)	-	5(100)		
Total	58(85.3)	10(14.7)	68(100)		
Address					
Urban	52(85.2)	9(14.8)	61(100)		
Semi urban	5(100)	-	5(100)		
Rural	1(50)	1(50)	2(100)	0.17(0.01, 3.02)	0.17
Total	58(85.3)	10(14.7)	68(100)		

Variable	No pregnancy	Pregnancy	Total	Odds ratio	P value
History of previous myomectomy					
No previous myomectomy	54(84.4)	10(15.6)	64(100)		
One previous myomectomy	4(100)	-	4(100)		
2 previous myomectomies	-	-			
Total	58(85.3)	10(14.7)	68(100)		
Size of myomas (Uterine size)					
12 weeks and below	1(100)	-	1(100)		
13 – 16 weeks	12(92.3)	1(7.7)	13(100)	3.50(0.14, 84.20)	0.42
17 – 20 weeks	18(78.0)	4(21.7)	22(100)		
21 – 26 weeks	20(87.0)	4(13.0)	24(100)	0.56(0.05, 5.96)	0.62
Above 26 weeks	7(87.5)	1(12.5)	8(100)		
Total	58(85.3)	10(14.7)	68(100)		
Number of myomas (by ultrasound scan)					
Single	5(83.3)	1(16.7)	6(100)	2.65(0.44, 16.04)	0.27
Multiple	53(84.1	9(13.23)	62(100)		
Total	58(85.3)	10(14.7)	68(100)		
Location of myomas					
Predominantly subserous	5(71.4)	2(28.6)	7(100)	2.29(0.37, 14.19)	0.36
Predominantly intramural	40(85.1)	7(14.9)	47(100)		
Predominantly submucous	8(100)	-	8(100)		
Not specified	5(83.3)	1(16.7)	6(100)		
Total	58(85.3)	10(14.7)	68(100)		
Indication for myomectomy					
Infertility alone	27(81.8)	6(18.2)	33(100)		
Infertility with Abdominal Mass	10(83.3)	2(16.7)	12(100)		
Infertility with menorrhagia	3(75.0)	1(25.0)	4(100)		
Infertility with intermittent abdominal pain	11(91.7)	1(8.3)	12(100)		
Infertility with other symptoms	7(100)	-	7(100)		
Total	58(85.3)	10(14.7)	68(100)		
Rank of the surgeon					
Consultant	22(78.6)	6(21.4)	28(100)	0.04(0.01, 0.24)	0.004
Senior resident	13(86.7)	2(13.3)	15(100)	1.77(0.22, 14.09)	0.58
Junior resident	23(92.0)	2(8.0)	25(100)		
Total	58(85.3)	10(14.7)	68(100)		

Variable	No pregnancy	Pregnancy	Total	Odds ratio	P value
Findings at laparotomy (possible risk factor for infertility)					
No associated finding	33(80.5)	8(19.5)	41(100)		
Unilateral hydrosalpinx	7(87.5)	2(12.5)	9(100)	1.18(0.20, 6.79)	0.08
Bilateral hydrosalpinx	9(90.0	-	9(100)		
Polycystic ovarian syndrome	5(100)	-	5(100)		
Endometriosis	2(100)	-	2(100)		
Gross pelvic adhesions	2(100)	-	2(100)		
Total	58(85.3)	10(14.7)	68(100)		

The caliber of the surgeon seem to have significant influence on conception rate; women whose myomectomies were done by consultants had higher rates than those done by senior residents, odd ratio = 0.04(0.01, 0.24), P =0.004. However, there was no difference in rates between senior and junior residents, odd ratio = 1.77(0.22, 14.09), P = 0.58.

The number of myomas is an important factor; women with solitary fibroids were twice more likely to become pregnant after myomectomy, when compared to women with multiple fibroids. odd ratio =2.65(0.44, 16.04).

Regarding intra-operative findings, a great majority of the pregnancies (8 out of 10) occurred in women without pelvic pathology, and there was no difference in conception rate among women with unilateral hydrosalpinx, odds ratio = 1.18(0.20, 6.79) P = 0.08. Pregnancy did not occur in the women with bilateral hydrosalpinx, polycystic ovarian syndrome (PCOS), endometriosis and gross pelvic adhesions.
With respect to Table 4, there is a weak correlation between the factors and conception rate, the strongest being maternal age, followed by parity.

Tables 5 and 6 are regression models of the predictor variables for conception following myomectomy. Using simple linear regression, the most prominent and significant predictors for conception were maternal age and parity, accounting for 5.4% and 5.3% of conception rates respectively. The weakest were occupation and uterine size.

On stepwise multivariate analysis, only 10.7% of the variation in conception rate was accounted for by variation in the significant variables, maternal age and parity, with a p value of 0.02. However when all the variables in Table 5 was subjected to multivariate analysis, the value increased from 10.7% to 36.5%.

DISCUSSION

For women with uterine fibroid and infertility, myomectomy is the treatment of choice, because of its high potential to conserve fertility. Hospital based studies in Nigeria reported abdominal myomectomy as the commonest treatment for uterine fibroids, with high rates of 77.6% in Uyo, [7] and 60.4% in Ilorin [6]. Gladly, quite an appreciable number of these women get pregnant following the procedure, with delivery of live babies.

High pregnancy rates have been reported in developed countries, 58% in Our Lady of Mercy Medical Center in New York, [23] 63% in Miyake Women's Clinic, Japan, [24] and 57% in Sheffield, UK [19]. These rates are relatively higher than those reported from many centers in West Africa; 25% in Ouakam Military Hospital in Senegal, [25] and 43.9% in Ile-Ife, Nigeria [17]. The disparity is not surprising because of the high rate of infertility in West Africa, from pelvic inflammatory disease [26]. In our study, the conception rate was even lower (14.7%), this is most probably due to the choice of study population, we used only women who had myomectomy for infertility, while the myomectomies in the studies above were not restricted. Besides, we excluded those who got pregnant from assisted conception.

Literature search has revealed that there is just a handful of publications on factors or predictors of conception after myomectomy operation. This indeed calls for further studies, as it is likely to serve as a useful tool for counseling, decision taking, treatment and prognosis, on patients on management for uterine fibroid.

There is overwhelming evidence that fertility declines linearly with maternal age, as a result of weaning ovarian function, and the effect has been reported to be more drastic after 35 years. [27] Findings from a study in Zegrab revealed that women above 30 years at the time of myomectomy were less likely to get pregnant with P = 0.0001, [28] and a similar study in Dakar, Senegal reported that fertility after myomectomy reduces as the patients' age increases with P = 0.042. Niang et al. [25] Using multivariate analysis, evidence from a study on reproductive outcome following abdominal myomectomy revealed that increased maternal age reduces the live birth rate, (OR =0.67, 95% CI 0.51-0.86, p = 0.002), and it was concluded that the major determinant of conception following myomectomy was maternal age [29]. It is therefore not surprising that in our study, the pregnancy rate was significantly higher among younger women.

Another factor that tends to influence to outcome of myomectomy is parity. A study in New York to determine whether myomectomy improves pregnancy outcome concluded that outcome was better in women that had previous pregnancies prior to the surgery [23]. The result was similar to that of our study; the pregnancy rate was higher among women with Para 2. This is most probably because women with infertility are expected to

have low parity [6,17]. This concept is further fortified by findings from a previous study; that fertility following myomectomy correlated significantly with fertility before myomectomy with p = 0.012, and parity with p = 0.004 [25].

The experience of the surgeon who carried out the myomectomy is crucial; myomectomy is one of the commonest causes of pelvic adhesions and infertility [30]. As a result, the affected and unfortunate women who thought that myomectomy was the solution to their predicament often gets disappointed; as the post-operative adhesions compounds the problem by causing more infertility. Experience from gynaecology units indicates that fellows in obstetrics and gynaecology are usually cautious about adhesion prevention when caring out myomectomy operations, because it's part of their training. It is therefore not suppressing that in our study, the conception rate was higher among the myomectomies done by our consultants.

Other important factors that have been reported in previous studies to significantly influence conception rate are the size of the fibroid (by abdominal palpation or intra-operative assessment), the location of the fibroids (usually by ultrasound scan), and the number of myomas (best by intra-operative assessment).

A study reported that subsequent fertility following myomectomy was significantly reduce by multiple and submucous myomas, P<0.005 to P<0.001 respectively [28]. Another study concluded that number of fibroids removed, and the indication for myomectomy predicted post-myomectomy fertility [23]. A study in Shanghai, China on the influence of size and site of myomas on pregnancy after myomectomy, it was reported that myoma size (biggest fibroid diameter < 10cm) was associated better pregnancy outcome. (rs = 0.095, with P = .039) [31].

Table 4. Correlation between demographic and surgical factors, and conception rate

Variable	Pearson's correlation coefficient
Age	0.234
Parity	0.230
Tribe	-0.125
Educational level	-0.117
Occupation	-0.050
Address	0.067
Size of fibroid (uterine size)	-0.042
Location of myomas	-0.108
Number of myomas by ultrasound	0.117
Indication for myomectomy	-0.153
Rank of the surgeon	-0.168
Findings at laparotomy	-0.187
History of previous myomectomy	-0.104

Table 5. Simple linear regression of the predictor variables and conception rate after myomectomy

Predictor variable	r^2 (%)	F-ratio	P value
Maternal age	5.4	3.984	0.04
Parity	5.3	3.932	0.05
Findings at laparotomy	3.5	2.398	0.13
Rank of the surgeon	2.8	1.907	0.17
Indication for myomectomy	2.3	1.574	0.21
Tribe	1.6	1.053	0.31
Educational level	1.4	0.915	0.34
Number of myomas by ultrasound	1.4	0.916	0.34
Location of myomas	1.2	0.784	0.38
History of previous myomectomy	1.1	0.784	0.38
Address	0.5	0.301	0.59
Occupation	0.2	0.164	0.69
Size of fibroid (uterine size)	0.2	0.916	0.34

Table 6. Stepwise multivariate analysis of the significant predictor variables and conception rate

Predictor variable	Step 1	Step 2
Maternal age	0.234	0.234
Parity		0.340
Constant	-0.536	-0.580
r^2	5.4%	10.7%
F- ratio	3.795	3.778
P value	0.04	0.02

Our study, being retrospective exclusively depended on records in the patients 'case notes, and documentation on intra-operative assessment of size of myomas, the number and location was poor; we were compelled to rely on information on preoperative ultrasound scan assessment. The sizes of the fibroids were estimated by abdominal palpation. However, our findings did not vary widely from those documented above, as our pregnancy rate was higher in women with fibroids of 16 weeks size and below, and submucous location was least associated with conception, followed by intramural.

There is no doubt that the conception rate in our study was significantly influenced by the coexisting pre-operative pelvic pathologies responsible for the infertility in our patients; a great majority of the pregnancies were from women with no pelvic pathology. It is not surprising that conception did not occur in the women with potentially serious pelvic pathologies like gross pelvic adhesions, bilateral hydrosalpinx, endometriosis and polycystic ovarian syndrome (PCOS). Some of these women may benefit, or may have benefited from assisted reproduction.

Using multivariate analysis, the significant predictors for conception in our study were maternal age and parity. However, they could only predict 10.7% of the conception rate. Even when all the factors were analyzed, including the non significant ones, they could only predict 36.5% of the pregnancy rate.

CONCLUSION

The conception rate following myomectomy in Yenagoa was relatively low, and the most important predictors were maternal age and parity. The bulk of the factors (65.5%) that determine conception are outside the scope of our study. These could be male factor infertility, factors within the tubal lumen, unidentified uterine synechia, and ovarian failure. In order to precisely validate the role of these factors in our women, further studies are recommended.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

Approval to proceed with this study was granted by the ethical committee of FMC Yenagoa, with reference number FMCY/REC/054/2020.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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