

Anaesthesia for Fibroid Surgeries: Experience from A Nigerian Tertiary Institution

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ABSTRACT

Introduction: Worldwide, uterine fibroid is the commonest gynaecological tumour in women. The standard treatment for symptomatic uterine fibroid is surgery. This is facilitated using anaesthesia, which could be general or Central neuraxial block (Regional anaesthesia, RA). In Nigeria, most women present late with huge fibroids which is a main determinant of the mode of anaesthesia. While general anaesthesia (GA) is more commonly used, it is not without challenges necessitating the increasing use of Regional anaesthesia (RA) which is thought to be more beneficial for the patient. This study seeks to audit the anaesthetic practice for fibroid surgeries over a five year period in our Institution, assess the role of RA and to generate awareness with a view to increasing its utilization for fibroid surgeries.

Material and methods: The Nurses' and Doctors' theatre records were reviewed for Socio demographics, type of anaesthesia, type of surgery and uterine size.

Result: Summary of statistics was done using percentages, means and standard deviation. Categorical variables were compared using the Chi-square test. A P-value of <0.05 was considered statistically significant. Five hundred and twenty five (525) surgeries were performed for women with uterine fibroid with an age range of 20-65 years. Two hundred and fifteen (215/41%) patients had GA, while 284 (54.1%) had RA. Twenty six patients (26.4.9%) had spinal anaesthesia that failed and had to be converted to GA.

Conclusion: There was a yearly increase in the use of RA, and a yearly decline in the use of GA. Regional Anaesthesia is the more commonly used mode of anaesthesia for fibroid surgeries in our institution

Keywords: Fibroid Surgery, Anaesthesia, Combined Spinal Epidural, Spinal, Myomectomy, Hysterectomy

hysteroscopy, laparoscopy, or as open abdominal procedure, endometrial ablation, uterine artery occlusion and focused ultrasound.⁴ In Nigeria, as in most Sub-Saharan Africa countries, laparoscopic surgeries are not common due to the dearth of trained laparoscopic surgeons. In addition, the huge fibroids that the women often present with make laparoscopic myomectomy or hysterectomy almost impossible.⁴ Medical treatment is out of reach of the average patient in Africa, thus most myomectomies especially abdominal myomectomy and hysterectomy remain the most common modes of treatment in Africa, the former being preferred for patients who want to preserve their reproductive capacity or have an aversion for hysterectomy.⁴

Surgical management is amenable to both General and Central Neuraxial Regional Anaesthesia (spinal, epidural and combined spinal/epidural anaesthesia) and the choice of anaesthesia depends on the expertise of the anaesthetist, patient's preference, surgeons request, duration of the procedure and availability of equipments, lifesaving drugs and anesthetic agents.^{3,5,6} However, a technique that is simple and subject to less constraint on personnel, equipment and drugs would be necessary. This is more so in our environment where there is a dearth of anaesthetist, patients are poor, hospital bills are high and resources available for health care are limited.⁷

Recently, there is a trend towards the increasing use of Regional anaesthesia for procedures that are amenable to Regional anaesthesia such as abdominal myomectomy and hysterectomy. A study on "anaesthesia in underdeveloped world: present scenario and future challenges" noted that the use of spinal anaesthesia is usually the choice in most surgical cases where it is feasible.⁸ This is because of its distinct advantage in preventing airway-related complications and its cost effectiveness which is well established in resource poor countries. Additional benefits of Regional anaesthesia include but not limited to; reduced incidence of postoperative nausea and vomiting, thromboembolic events, better postoperative

INTRODUCTION

Uterine fibroids (also known as myomas or leiomyomas) are the most common benign solid tumours found in the female genital tract. Prevalence ranges from 30% to 80% depending on the age of the patient.¹ They occur in 20–25% of women of reproductive age causing 3–5% of gynaecology consultations.^{2,3} In Nigeria, it is the most common tumour in the female population, probably occurring in over 80% of women over the age of 25 years even if only of the size of a seedling.⁴

Options available for the treatment of uterine fibroids include; expectant management, medical therapy with gonadotropin-releasing hormone agonists or progesterone receptor modulators, surgical management which may be hysterectomy and myomectomy and can be carried out via

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analgesia, reduced blood loss and transfusion requirements when compared to general anaesthesia, length of hospital stay, incidence of complication rates as well as improvement in the overall outcome of surgery.^{5,9-13} General anaesthesia on the other hand may induce potential complications, such as adverse reactions to drugs, increase pulmonary and airway – related complication rates, severe hypotension, and postoperative nausea and vomiting.⁶

Modern technology has produced better equipments than was hitherto available with the result that spinal anaesthesia is undoubtedly simple, portable, cheaper and above all safer than it used to be. Spinal anaesthesia is an established option for Myomectomy (abdominal myomectomy and hysterectomy), but in some conditions, it does not outlast the period of surgery, thereby necessitating its combination with another technique⁶

In recent times, combined spinal/epidural anaesthesia (CSE) has emanated and has been used increasingly over the last decade. It combines the benefit of rapidity, density, and reliability(definitive end point with the appearance of cerebrospinal fluid) that is characteristic of single shot spinal anaesthesia with the flexibility of continuous epidural to vary the intensity of the block, control the duration of anaesthesia, and deliver postoperative analgesia.^{14,15} Compared to the epidural or single shot spinal anaesthesia alone It offers the benefit of analgesia even in prolonged surgeries and in the postoperative period and circumvents the inadequacy of single spinal anaesthesia. It also averts all the airway related complications associated with general anaesthesia.⁶ This practice however requires elevated level of skill and training and for now its performance is the exclusive preserve of physician anaesthetists. There is sufficient manpower, skill and equipment required for the above practice in our institution. Therefore, due to the benefits of regional anaesthesia compared to general anaesthesia, the availability of equipments and skill for this procedure in our facility, we encouraged the increased utilization of regional anaesthesia for fibroid surgeries in our centre. This five year retrospective review seeks to audit the anaesthetic practice for fibroid surgeries, assess the role of regional anaesthesia and to generate awareness with a view to increasing its utilization for fibroid surgeries

MATERIAL AND METHODS

The study was conducted following approval by the Institution’s Research Health and Ethics Committee. The Doctors and nurses theatre record of patients who had surgeries for fibroid at the University of Abuja Teaching Hospital (U.A.T.H) from January 1st 2012 to December 31st2016 were retrospectively reviewed.The Nurses’ and Doctors’ theatre records were reviewed for Socio demographics, type of anaesthesia, type of surgery and uterine size. Fibroid size ≤ 14

weeks size was considered as non-huge while fibroid size of > 14 weeks size was considered as huge. Data was analyzed using Statistical Package for Social Science (SPSS) version 20. Summary of statistics was done using percentages, means and standard deviations. Categorical variables were compared using the Chi-square test. A P-value of <0.05 was considered statistically significant. Result is presented using tables and graphs as appropriate.

Five hundred and twenty five patients (525) with uterine fibroid had surgery during the study period. The age range is as depicted in Table 1.

RESULTS

The uterine fibroid size ranged from 8 – 40 weeks size. Uterine fibroid sizes of 14 – 22 weeks size constituted 327 (62.3%) of the total number as seen Table 2.

Types of surgery: Three main types of surgeries were done; Four hundred and forty seven (447 (85.1%) had Abdominal myomectomy while 71 (0.14%) and 7(0.01%) had Total abdominal hysterectomy and vaginal hysterectomy respectively. 83% (371) and 17% (71) of the patients that had abdominal myomectomy were for huge fibroids as seen in Table 3.

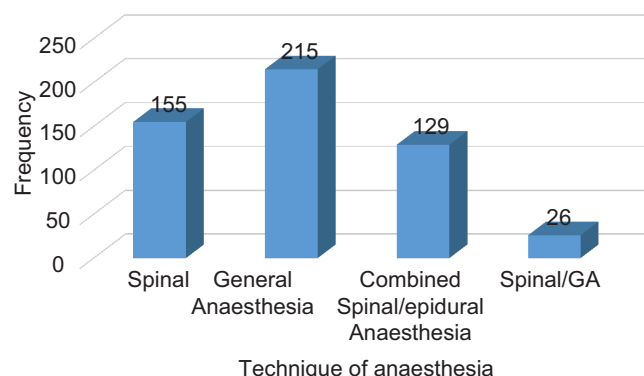


Figure-1: Showing frequency of the different types of Anaesthesia

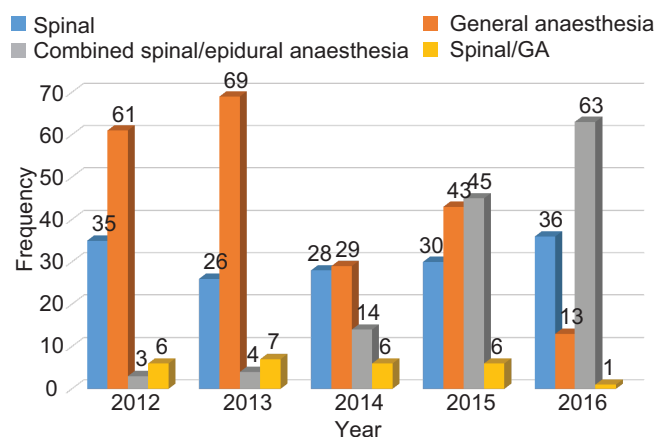


Figure-2: Comparison of type of anaesthesia

	N	Minimum	Maximum	Mean	Std. Deviation
Age(Years)	525	20.00	65.00	36.5371	6.36614
Valid No	525				

Table-1: Descriptive Statistics for Age (years)

Type of Anaesthesia: Table 4 and Figure 1 shows the different types of Anaesthesia given. 54.1% (284) patients

Fibroid size	Frequency	Percent
8.00	1	.2
10.00	11	2.1
12.00	23	4.4
14.00	63	12.0
16.00	88	16.8
18.00	62	11.8
20.00	63	12.0
22.00	51	9.7
24.00	32	6.1
25.00	1	.2
26.00	26	5.0
27.00	1	.2
28.00	18	3.4
30.00	24	4.6
32.00	18	3.4
34.00	19	3.6
36.00	20	3.8
37.00	1	.2
38.00	2	.4
40.00	1	.2
	525	100.0

Table-2: Sizes of Fibroid, no, and percentages

had Regional Anaesthesia (spinal 29.5% 155, combined spinal/epidural, 24.6% (129) versus 41% (215) for General anaesthesia.

Table 5 and figure 2 shows yearly trends in the use of the different methods of anaesthesia. It shows a sustained increase in the use of combine spinal epidural anaesthesia, sustained decrease in the use of general anaesthesia while there was a marginal increase in the use of spinal anaesthesia. 5% (26) had spinal anaesthesia that failed and were converted to General anaesthesia as seen in Table 5. Table 5 shows that the conversion rate of spinal to General anaesthesia declined from 1.1% (6) in 2012 to 0.2% (1) in 2016. This was statistically significant. The use of Regional Anaesthesia increased from 7.3% (38) in 2012 to 18.9% (99) in 2016 and this was statistically significant while the use of General anaesthesia declined from 11.6% (61) in 2012 to 2.5% (13) in 2016. This was also statistically significant. The conversion rate of spinal to General anaesthesia declined from 1.1% (6) in 2012 to 0.2% (1) in 2016. This was statistically significant as seen in Table 5. Table 6 shows that the decline in the use of general anaesthesia and the increase in the use of regional anaesthesia was statistically significant. $P < 0.01$. There was only a slight increase in the use of spinal anaesthesia; 12.3% of total Regional anaesthetics given and 6.6% of total anaesthetics in 2012 to 12.7% of all Regional anaesthetics and 6.9% of all anaesthetics in 2016 as seen in

Surgeries done for fibroid	Fibroid size		Total
	≤14 n (%)	>14 n (%)	
Abdominal myomectomy	76(17)	371(83)	447
Total abdominal hysterectomy (TAH)	17(23.9)	54(76.1)	71
Vaginal hysterectomy	7(100)	0(0)	7
Total	100	425	525

Table-3: Shows the Surgeries done, no and percentage for huge and non-hugefor fibroids

Anaesthesia	Frequency	Percentage (%)
Spinal	155	29.5
General anaesthesia	215	41.0
Combined spinal/epidural anaesthesia	129	24.6
Spinal/GA	26	5.0
Total	525	100.0

Table-4: Techniques of Anaesthesia

Type of anaesthesia	Years					Total
	2012	2013	2014	2015	2016	
Spinal	35(6.7)	26(5.0)	28(5.3)	30(5.7)	36(6.9)	155
General anaesthesia	61(11.6)	69(13.1)	29(5.5)	43(8.2)	13(2.5)	215
Combined spinal/epidural anaesthesia	3(0.6)	4(0.8)	14(2.7)	45(8.6)	63(12.0)	129
Spinal/GA	6(1.1)	7(1.3)	6(1.1)	6(1.1)	1(0.2)	26
Total	105	106	77	124	113	525

Table-5: Showing yearly trend with no and percentages for the different types of anaesthesia

Regional	General	χ^2	P-value
284(54.6%)	215(41.0)	18.709	<0.001

Table-6: Showing statistically Significant Difference in the Usage of the Two Main Types of Anaesthetics Techniques

Table 5. No patient had epidural anaesthesia alone.

DISCUSSION

The mean age of patients in this study was 36.5 ± 6.3 years. They were all Nigerians of different ethnicities. This is comparable to the study by Adesina et al from Ilorin that got a mean age of 34.3 ± 5.6 years and an American study where the incidence of uterine fibroid was 60% at 35 years among African American women.^{3,16}

Globally there is a trend towards the increasing use of Central Neuraxial Regional anaesthesia (RA) (Spinal, epidural, combined/epidural) for procedures that are amenable to RA including Fibroid operations.⁶ Before the advent of RA general anaesthesia was the main mode of anaesthesia done for fibroid surgeries. When properly conducted it provides abdominal relaxation, good airway control, analgesia, unconsciousness, and is fit for extra-long duration surgeries.¹⁷ Main shortcomings include, high frequency and severity of PONV, high prevalence of DVT, Venous thromboembolism (VTE) or pulmonary embolism (PE).^{18,19} High morbidity and mortality during intubation, and for hypertensive patients the need to obtund the haemodynamic response following endotracheal intubation in order to avert undesirable consequences.²⁰ The need for alternative modality of anaesthesia definitely exists. Spinal, Epidural, and combined spinal/ epidural anaesthesia are being used as alternatives with good result. All these except epidural anaesthesia were seen in these study.

In our study, the majority of the surgeries done for fibroid surgeries, 447(85.1%) were Abdominal myomectomy, while the Others 71 (13.5%) and 7(1.3%) had Total abdominal hysterectomy and vaginal hysterectomy respectively. Our result is similar to that by Atombosoba et al and Ezeama et al where 97.3% and 90.3% of their fibroid surgeries were done using of abdominal myomectomy respectively.^{21,22} This high incidence seen in our study can be attributed to the fact that majority (81.4%) of the women presented late for treatment with huge fibroids which ranged between 16-40 weeks size making open abdominal myomectomy the most likely option for treatment.^{4,23} Depending on the number, size, and location of the fibroids, myomectomy may be by hysteroscopy, laparoscopy, or as an open abdominal procedure.^{2,21} Being a retrospective study the influence of these factors could not be ascertained. Laparoscopic myomectomy may be an option where there are small numbers of sub-serous or intramural myomas and the uterine size is less than 16 weeks. A high percentage (81.4%) of patients presented with uterine size greater than 16 weeks size making laparoscopic myomectomy less likely as the surgeon will most likely counsel them for open abdominal myomectomy because of the large uterine size.^{17,24} Other factors that could have been responsible for this high use of open abdominal myomectomy include the unavailability of surgical expertise for laparoscopy, specialized equipments and cost as well as an influx of patients into the hospital as our institution is a major referral centre. Our centre has no surgical expertise as well as specialized equipments for

laparoscopic myomectomy. The value obtained from this study is however much higher compared to the study by Nnaji and Chiekwe in Owerri where a total of 202 patients had abdominal myomectomy over a five year period.⁶

The use of RA was significantly higher in this study compared to GA 54.6% (284) versus 41% (215) $P < 0.001$. The benefits offered following the use of CSE (good analgesia even in prolonged surgeries and in the postoperative period, avoidance of airway related complications associated with general anaesthesia, e .t. c) encouraged the use of RA especially CSE.^{6,14,15} The study by Otokwala and Ebirim in PortHarcourt that analysed the outcome for women who presented with huge uterine fibroids and for whom combined spinal epidural (CSE) technique was used for open abdominal myomectomy concluded that CSE technique is safe, with relatively low rate of perioperative complications when used during open abdominal myomectomy for huge uterine fibroids.²⁵

General anaesthesia sometimes can be associated with some morbidity like airway mishap, awareness, pain, cardiovascular collapse and respiratory depression.⁶ In addition, lack of equipment and monitors can negatively influence the use of general anaesthesia for surgeries.^{6,26} In this study 427 (81.3%) of the patients presented with huge fibroid (>14 weeks size). With huge fibroids, there is the risk of increased bleeding from GA and the duration of surgery may be prolonged. These are potential risk factors for perioperative morbidity and mortality.²⁵ All these may have influenced the use of RA in our centre. In addition our residents are highly skilled in the performance of RA. This fact was responsible for the consistent yearly increase in CSE use while there was a concomitant consistent decrease in the use of GA seen in our study. Our finding is contrary to the findings of Nnaji and Chiekwe that demonstrated a 79% general anaesthesia use for myomectomy in their centre.⁶ Their study also showed that over a five year period (2009-2013), general anaesthesia was the main mode of anaesthesia for abdominal myomectomy. No reason was given for this high use of general anaesthesia.

This study showed a marginal use and increase in the use of Spinal anaesthesia but this was not significant: (6.7%/35 in 2012 versus 6.9%/36 in 2016). The use of Spinal anaesthesia for abdominal myomectomy has been demonstrated in several studies.^{6,7,23} Spinal anaesthesia has the advantage of preventing airway related morbidities associated with general anaesthesia, and it's cost effective, however, it can be associated with some complications like hypotension, bradycardia, headache, and urinary retention. Establishing spinal anaesthesia service also requires one to have resuscitative equipment and drugs, which are usually lacking in most health institutions in developing countries.²⁶ While CSE allows the anaesthetist to continue to give good analgesia in the perioperative period, spinal anaesthesia does not offer that privilege. Single shot spinal anaesthesia has a limited duration of action except when used as a continuous spinal anaesthesia (CSA) technique with catheter.²⁵ Catheters for CSA are not available in our centre. Thus most of the

anaesthetists opted for CSE as the RA of choice rather than Spinal. Our finding is contrary to that of Nnaji and Chikkwe in Nnnewi where spinal anaesthesia was used for 31% of their patients.⁶

Spinal anaesthesia sometimes does not outlast the duration of the surgery, thereby necessitating the need to provide other means of ensuring analgesia and possible hypnosis during the rest of the period of surgery.⁸ In our study, 5% (26) of the patients had Spinal Anaesthesia that was inadequate and had to be converted to GA. The main reason for the conversion was due to the fact that spinal was inadequate as a result of unexpected prolonged duration of surgery. In these patients the general anaesthesia component was started following the regression of sensory blocks of the spinal anaesthesia while the surgery was on going. There was a decrease in this conversion rate from 1.1% (6) in 2012 to 0.2% (1) in 2016 due to better assessment of the skill of the surgeons and appropriate choice of alternatives which in this instance was CSE.

Epidural anaesthesia alone is another choice of anaesthetic technique for myomectomy. However, this was not demonstrated in our study. The benefits of epidural are similar to other Central neuraxial Regional Anaesthetic techniques. It provides good and continuous analgesia during surgery, when surgery is prolonged and in the postoperative period. However, its onset of sensory block can be delayed, and at times it offers patchy sensory blockade. It also requires elevated level of skill to perform the procedure. All these negative effects have been overcome by the CSE technique, the use of which is well demonstrated in this study.

This study demonstrated a sustained increased utilization of central neuraxial Regional anaesthesia for fibroid surgeries. This supports the recent trend of increased utilization of Regional Anaesthesia for surgeries that are amenable to Regional anaesthesia due to its established and perceived advantages over General anaesthesia as well as its acceptance.^{5,9-13} With increasing ASA status, the balance of risks favours RA compared to GA.¹¹ Rare idiosyncratic (unpredictable) causes of major harm, in the form of malignant hyperthermia and drug allergy are, respectively, entirely or almost entirely avoided with RA compared with GA.¹¹ Evidence is also in favour of better perioperative outcome with RA compared with GA in terms of deep vein thrombosis, myocardial events, pulmonary complications.¹¹ Because of its simplicity and decreased need for oxygen, RA is frequently performed for gynaecologic and obstetric surgery in Sub-Saharan Africa.²⁷

The high incidence of the use of general anaesthesia in 2012 was due to lack of sufficient trained personnel who are conversant with the art of instituting Regional blocks (spinal and combined spinal/ epidural blocks). This, however improved with the employment and training of more physician anaesthetists.

CONCLUSION

Most of our fibroid surgeries were performed using both Central Neuraxial Regional (RA) and General anaesthetic

techniques but with a statistically significant more use of Regional anaesthesia. While there was a yearly increased use of Regional Anaesthesia, there was a concomitant decrease in the use of General Anaesthesia. Most of the anaesthetists preferred CSE to single shot spinal as most of the fibroids were huge and experience showed that with spinal the surgery tended to outlast the block. The use of CSE provided also better postoperative analgesia for our patients than single shot spinal anaesthesia. Thus only a small and insignificant proportion of patients had one shot spinal. This is commendable as it has helped to improve the skill of the anaesthetist in the performance of CSE. Finally, this study shows and supports increased utilization of RA for fibroid surgeries for the benefits it confers which among other others includes improved proficiency and the benefit of better intra and post postoperative analgesia.

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