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The Effect of Uterine Artery Occlusion with Tourniquet on Ovarian Reserve during Open Myomectomy at a University Teaching Hospital in Southern Nigeria

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Abstract

Background: The most common surgical treatment for symptomatic uterine fibroids, particularly in women with fertility concerns, is open myomectomy. Given the high vascularity of the uterus, haemorrhage during the procedure is a serious risk that is often mitigated with a uterine tourniquet. **Aim and Objectives:** To evaluate the effect of uterine artery occlusion with a tourniquet during open myomectomy on ovarian reserve using serial anti-Mullerian hormone (AMH) measurements. **Materials and Methods:** This was a prospective longitudinal study with a quasi-experimental design and a convenient sampling technique. The study enrolled 47 women who had abdominal myomectomy between September 1, 2021, and March 31, 2022, at the University of Port Harcourt Teaching Hospital. Blood samples were collected before anaesthesia was administered in theatre, on day two, and three months after open abdominal myomectomy for anti-Mullerian hormone assay. The data was collected using a semi-structured proforma, entered into an Excel spreadsheet, and analyzed using SPSS version 25.0 with a 95% confidence interval. Statistical significance level was set at 0.05. **Results:** The pre-surgery AMH mean value was 1.67 ± 1.44 ng/ml, while the values after using a uterine tourniquet at myomectomy on the second day and three months later were 1.22 ± 1.24 ng/ml and 1.59 ± 1.43 ng/ml, respectively. There was no statistically significant change in AMH levels, and there was no statistically significant relationship between blood loss and tourniquet time and AMH after open abdominal myomectomy. **Conclusion:** The use of a uterine tourniquet and blood loss during open myomectomy has no effect on ovarian reserve.

Keywords

Uterine Tourniquet, Open Abdominal Myomectomy, Ovarian Reserve,

Anti-Mullerian Hormone, Nigeria

1. Introduction

Uterine fibroids, also known as uterine leiomyomas, are benign uterine tumours composed primarily of smooth muscles and varying amounts of connective tissue. They have a monoclonal origin [1] [2]. They have a 20% - 25% incidence and rise to nearly 50% by the fifth decade of life, making them the most common female reproductive tract tumours [1] [2]. The prevalence of uterine fibroid varies according to race, tribe, age, family history, and other factors. Black people have higher prevalence rates than Caucasians and Hispanics [1] [2].

Globally, the prevalence of uterine fibroids range between 4.5% and 9.8% in developed countries. In Nigeria, it is 21.4% in Kano, 13.3% in Ilorin, and 33.3% in Port Harcourt [3] [4] [5] [6].

Causes of uterine fibroids are unknown. Nulliparity, advanced maternal age, a family history of myomas, oral contraceptives, hormone replacement therapy, early menarche, a sedentary lifestyle, and obesity are all risk factors for uterine fibroids [1] [2] [3]. Meanwhile, cigarette smoking, two full-term pregnancies, and increased parity are thought to reduce its occurrence [1] [2] [3].

The management options are expectant, medical, surgical, and radiological. This is determined by the patient's age, parity, pregnancy status, reproductive plans, general well-being, and the size and location of the leiomyomas [1] [2] [3] [7]. Asymptomatic fibroids are usually managed expectantly. The mainstay of treatment for leiomyomas is surgery, and open abdominal myomectomy is the most common surgical management, particularly for women with fertility concerns, whereas hysterectomy is the definitive treatment and is usually offered to women with completed family size [1] [2] [3] [8] [9] [10]. In the tropics, other uncommon forms of treatment include uterine artery embolization, myolysis, uterine artery ligation, hysteroscopic myoma resection, and laparoscopic laser treatment [1] [8] [9] [10]. Prior to surgery, danazol, antiprogesterones, and gonadotrophin-releasing hormone (GnRH) agonist and antagonist can be administered to cause endometrial atrophy and shrink the fibroids [1] [10].

Open abdominal myomectomy, offered to women with symptomatic myomas concerned about their fertility poses a significant challenge of haemorrhage during and after the procedure due to uterus's high vascularity. In the tropics, uterine artery occlusion with a tourniquet is commonly used; it temporarily occludes the uterine arteries, which also supply blood to the ovaries, with the potential of interfering with normal ovarian physiology [1] [2] [3]. Although there are some concerns about the use of uterine tourniquets, it is still a valuable tool for many doctors, particularly in the tropics where there are many myomas and cultures that are opposed to blood transfusions because its use temporarily blocks blood flow to the uterus and ovaries, allowing a bloodless surgical site and increasing surgeons' comfort [1] [2] [11].

Furthermore, the tourniquet's arterial ligation causes tissue compression at the tourniquet's numerous points of passage in addition to temporarily stopping the blood flow downstream. The consequences of ischaemia and reperfusion from this circulatory disruption could include tissue damage, cell necrosis, organ physiological failure, and even a reduction in ovarian reserve. Systemic complications have been reported during various non-gynaecological surgeries involving tourniquets; most of which result from the length of the application and subsequent relaxation. The average time required to apply a tourniquet during uterine surgery is 60 minutes, not including rest intervals. Alternatively, the timing of the onset of ischaemia and reperfusion at the uterine and systemic levels while using tourniquet needs to be better established as several researchers have not documented specifically when the ischaemia first occurred or how they manifested systemically [11].

The anti-Mullerian hormone is frequently used to evaluate ovarian reserve. It is secreted by the granulosa cells of small antral and pre-antral follicles. Its function is unknown, but research suggests that it influences ovarian steroidogenesis and follicular recruitment. In contrast to other biochemical indicators, AMH can be detected on any day of the cycle and does not fluctuate between cycles. Poor responders were identified using various threshold values ranging from 0.2 - 1.26 ng/ml, with sensitivity of 80% - 87% and specificity of 64% - 93%. Nomograms are used to detect age-related physiological declines in ovarian reserve and AMH levels, and abnormal deviations can be used to counsel couples concerned about their fertility. The anti-Mullerian hormone is unaffected by gonadotropin, and its value remains relatively constant throughout menstrual cycles. It is simple to measure, minimally intrusive, and offers a high degree of predictability; as a result, it is regarded as the most reliable marker for ovarian reserve or function [12] [13] [14] [15].

Several studies using AMH found no significant effect on ovarian function after myomectomy when the uterine tourniquet was used; however, other studies revealed a transient or short-term change in ovarian function after myomectomy [16] [17] [18]. Concerns have been raised that the ischaemic reperfusion injury caused by the single tourniquet approach, which is commonly used to limit blood loss during abdominal myomectomy, may diminish or modify ovarian reserve, affecting conception. Furthermore, many of these scientific studies excluded the black race, which is known to have more symptomatic myomas. This study was conceptualized given the premium placed on pregnancy and childbirth in Africa.

2. Materials and Methods

2.1. Study Area

The study was carried out at the Gynaecology unit of the University of Port Harcourt Teaching Hospital (UPTH). The UPTH is an 884-bed hospital located at Alakahia in Obio Akpor Local Government Area of Rivers State, South-South Nigeria. It is a tertiary health institution that provides all levels of health care services to Rivers, Bayelsa, Delta, Imo, Abia, and Akwa-Ibom states.

The gynaecology clinic is open Monday through Friday. Nurses register patients at each clinic, recording their height, weight, and blood pressure. Following that, the patients are seen by doctors who take a detailed history, perform physical examinations, and make a clinical diagnosis. Specific investigations are requested based on the clinical diagnosis, and appropriate treatment is instituted. Patients are then followed up on at various intervals. This process was used to recruit the patients used for this study.

The patients with uterine fibroids that require surgical treatment are counselled at the clinic before being admitted to the gynaecology ward, where they are reviewed by other relevant specialties and certified fit for surgery. On the average, one hundred and ten (110) open abdominal myomectomies are performed per annum accounting for approximately 40% of major gynaecological surgeries [19].

The Chemical Pathology department is staffed by consultant chemical pathologists, resident doctors, and laboratory scientists at the hospital. The chemical pathology laboratory is well-equipped and was used for AMH assay.

2.2. Study Design

A prospective longitudinal study with a quasi-experimental design was used for this study. The study included patients who had open abdominal myomectomy and were between the ages of 18 and 40. Patients over the age of 40, use of Gonadotropin Releasing Hormone Agonists in the previous 3 months, concurrent ovarian surgery, association with adnexal tumours or previous adnexal surgery, preoperative evidence of ovarian insufficiency, suspicion of gynaecological malignancy, exposure to radiotherapy or chemotherapy, and endometriosis were excluded.

2.3. Sampling Technique

This sample size was calculated with a 95% confidence level using Rosner's formula [20]. The study had a sample size of 52 participants. The convenience sampling technique was used to recruit participants for the study as all patients scheduled for myomectomy at the gynaecology clinic who met the eligibility criteria and provided consent were recruited.

The purpose and benefits of the study were duly explained to the participants at the gynaecology clinic, and written informed consent was obtained in the ward. All relevant data were obtained from the patient's case file and entered into the research proforma. Five registrars were recruited as research assistants, and they received extensive training in patient selection and counselling, blood sample collection, and proper data collection sheet completion. Meanwhile, the anaesthetic team at the study centre routinely recorded blood loss, surgery time, and tourniquet time.

2.4. Sample Collection and Processing

The laboratory work of this study was carried out at the Chemical Pathology department of the hospital by trained chemical pathologists. Five millilitres of venous blood were drawn from the patient's cubital vein using a sterile disposable syringe and needle with a tourniquet after proper aseptic precautions. The blood samples were collected into a plain redtop venepuncture tube without additives or anticoagulants by the principal investigator and research assistants before induction of anaesthesia in the theatre, two days, and three months after open myomectomy. The blood samples were sent immediately to the chemical pathology laboratory, where it was centrifuged for 20 mins at 4000 rpm and 4˚C to obtain sera. The separated sera were collected using a pipette, and the assay was done immediately within 30 minutes of blood collection. However, for the specimen that could not be assayed immediately after blood withdrawal, the samples were stored at a temperature of 2˚C - 8˚C for up to seven days or −20˚C for up to 30 days for later analysis using an enzyme-linked immune-sorbent assay kit (AMH Accubind Test system). The result was calculated and interpreted based on the patients' age. The reference ranges are 1.57 - 12.41 ng/ml for ages 20 - 29 years, 0.11 - 12.67 ng/ml for 30 - 39 years and 0.02 - 9.77 ng/ml for those between 40 - 49 years.

2.5. Ethical Consideration

Ethical approval for this study was obtained from the research ethics committee of the University of Port Harcourt Teaching Hospital. The ethical clearance certificate number was UPTH/ADM/90/S. II/VOL.XI/1220. All participants were adequately counselled and written consent was obtained, before enrolment. The study was carried out under strict confidentiality.

2.6. Data Analysis

Data were entered into an excel spread sheet and analyzed with the Statistical Package for Social Sciences version 25 at 95% confidence interval. Continuous variables were summarised using means and standard deviations while categorical variables were expressed as proportions and frequencies. The difference in means was compared using the paired t-test (for 2 mean groups) and Analysis of Variance-ANOVA (for 3 mean groups). An observation was said to be statistically significant if the p-value was less or equal to 0.05 ($p \le 0.05$).

3. Results

The study enlisted the participation of 52 women who met the inclusion criteria. However, five study participants who had previously lived in the study area relocated and dropped out. As a result, data from 47 women were analysed, yielding a 90% compliance rate. Most of the women 17 (36%) were aged 35 to 39 years, 27 (57%) were single, and 30 (64%) had tertiary education. Many of them 39 (82.9%) were nulliparous, and 23 (49%) had normal body mass index (BMI) of 18.5 - 24.9 kg/m^2. Table 1 demonstrated these findings.

Table 2 showed that menorrhagia was the most common symptom 43 (91.5%), followed by abdominal pain 36 (76.6%). The mean preoperative anti-Mullerian hormone assay was 1.67 ng/ml.

In terms of surgical characteristics, the tourniquet time was 45 - 60 minutes for 21 of the participants (51.1%), while the duration of surgery was 90 - 120 minutes for 27 (57.5%) of the women. The locations of the fibroids were sub-mucous 46 (97.9%), followed by subserous 37 (78.7%) and intramural 36 (76.6%).

Table 1. Socio-demographic characteristics of patients.

Variables	Frequency (n = 47)	Percent (%)
Age (years)		
20 - 24	4	8.5
25 - 29	10	21.3
30 - 34	16	34.0
35 - 39	17	36.2
Marital Status		
Single	27	57.5
Married	19	40.4
Divorced	1	2.1
Educational Status		
Primary	2	4.3
Secondary	15	31.9
Tertiary	30	63.8
Occupation		
Unemployed	6	12.8
Student	3	6.4
Civil servant	13	27.7
Business	25	53.2
Parity		
P0	39	82.9
P1	8	17.0
BMI (kg/m^2)		
18.5 - 24.9	23	48.9
25 - 29.9	16	34.0
>30	8	17.0

Table 2. Pre-surgery characteristics of patients.

Variables	Frequency (n = 47)	Percent (%)
***Fibroid symptoms**		
Menorrhagia	43	91.5
Pain	36	76.6
Pressure symptoms	16	34.0
Infertility	5	10.6
AMH (ng/ml)		
Mean (SD) [Min, Max]	1.67 ± 1.44 [0.26, 7.08]	

SD = Standard deviation **Multiple responses apply.

In 21 (44.7%) of the procedures, less than 500 mls of blood was lost, and 35 (74.4%) of the procedures were performed by consultants. The most common skin incision was a transverse suprapubic incision 38 (80.9%), and most patients 29 (61.7%) had combined spinal and epidural anaesthesia. Table 3 showed these results.

As shown in Table 4, the mean anti-Mullerian Hormone assay for the second postoperative day was 1.22 ng/ml. None of the participants were admitted for more than seven days after the operation. Three months after surgery, the mean anti-Mullerian Hormone assay was 1.59ng/ml. The effect of uterine artery occlusion during open abdominal myomectomy on anti-Mullerian Hormone levels is shown in Table 5 (pre-surgery, second day, and three months post-surgery). The mean pre-surgery AMH level was 1.67 ± 1.44 ng/ml, which reduced to 1.22 ± 1.24 ng/ml on the second post-surgery day before increasing to 1.59 ± 1.43 ng/ml three months later, a value close to the pre-surgery AMH value. However, no statistically significant change in AMH levels was observed across the three time periods.

The mean pre-surgery AMH level for the < 45 mins group was 1.22 ± 1.31 ng/ml, which was significantly lower than the other groups. The mean AMH level decreased on the second post-surgery day across the four tourniquet time groups, returning to near pre-surgery levels three months later. However, there was no statistically significant relationship between tourniquet time and anti-Mullerian hormone levels during open myomectomy (pre-surgery p = 0.802; second day post-surgery p = 0.786; 3 months post-surgery p = 0.831). This was shown in Table 6.

The mean pre-surgery AMH level for the < 500 mls blood group was 1.54 ± 1.63 ng/ml, which was slightly lower than the 500 - 1000 mls group and significantly lower than the > l000 mls group. The mean AMH level decreased steadily across the three blood loss groups on the second post-surgery day, corresponding to an increase in blood loss, and returned to nearly pre-surgery levels three months later (Table 7).

The mean pre-surgery AMH level was 1.67 ± 1.44 ng/ml, dropped to 1.22 ±

Table 3. Surgical characteristics of patients.

Variables	Frequency	Percent (%)
Tourniquet time (mins)		
≤45	7	14.9
>45 - 60	24	51.1
>60 - 90	14	29.8
>90 - 120	2	4.3
Duration of surgery (mins)		
60 - 90	4	8.5
>90 - 120	27	57.5
>120	16	34.4
Number of fibroids		
<10	15	31.9
>10 - 20	21	44.7
>21 - 30	6	12.8
>30	5	10.6
Largest diameter (cm)		
<5	8	17.0
5 - 10	35	74.5
>10 - 20	4	8.5
***Sites of fibroids (n = 119)**		
Sub-serous	37	78.7
Intramural	36	76.6
Sub-mucous	46	97.8
Estimated blood loss		
<500 mls	21	44.7
>500 mls - 1000 mls	20	42.6
>1000 mls	6	12.8
Cadre of surgeon		
Senior Registrar	12	25.5
Consultant	35	74.5
Type of skin incision		
Midline	9	19.1
Transverse suprapubic	38	80.9
Type of Anaesthesia		
SAB	18	38.3
Epidural and SAB	29	61.7

*SAB: Subarachnoid block *Multiple responses apply.

Table 4. Post-Surgery characteristics of patients.

Variable	Frequency (n = 47)	Percent (%)
2nd day Post-Surgery AMH (ng/ml)		
Mean (SD) [Min, Max]	1.22 ± 1.24 [0.21, 6.8]	
Duration of hospital stay		
<7 days	47	100.0
>7 days	0	0.0
Post-operative complications		
Anaemia with Blood Transfusion	7	14.9
None	40	85.1
3 months Post-Surgery AMH (ng/ml)		
Mean (SD) [Min, Max]	1.59 ± 1.43 [0.24, 6.96]	

*SD = Standard deviation.

Table 5. Effect of uterine artery occlusion during open abdominal myomectomy on anti-Mullerian Hormone levels.

Group	Mean ± SD (ng/ml)	ANOVA	p-value
Pre-Surgery AMH	1.67 ± 1.44		
2nd day Post-Surgery AMH	1.22 ± 1.24	1.46	0.236
3 months Post-Surgery AMH	1.59 ± 1.43		

*ANOVA = Analysis of variance.

Table 6. Effect of tourniquet time on anti-Mullerian Hormone levels.

Variables Tourniquet time	AMH Level					
	Pre Surgery (ng/ml) Mean ± SD	ANOVA (p-value)	2nd day post-Surgery (ng/ml) Mean ± SD	ANOVA (p-value)	3 months post-Surgery (ng/ml) Mean ± SD	ANOVA (p-value)
≤45 mins	1.22 ± 1.31		0.95 ± 1.11		1.15 ± 1.27	
>45 - 60 mins	1.78 ± 1.69	0.35 (0.802)	1.27 ± 1.48	0.35 (0.786)	1.67 ± 1.67	0.29 (0.831)
>60 - 90 mins	1.65 ± 1.05		1.17 ± 0.84		1.62 ± 1.11	
>90 - 120 mins	2.14 ± 1.60		1.95 ± 1.37		2.01 ± 1.42	

*ANOVA = Analysis of variance.

1.24 ng/ml on the second post-surgery day, and slightly decreased to 1.59 ± 1.43 ng/ml three months later (Table 8). Table 9 compares the effect of uterine artery occlusion during open myomectomy on anti-Mullerian hormone levels on the

Table 7. Effect of blood loss on anti-Mullerian Hormone levels.

Variables Estimated blood loss	AMH level					
	Pre Surgery (ng/ml) Mean ± SD	ANOVA (p-value)	2nd day post-Surgery (ng/ml) Mean ± SD	ANOVA (p-value)	3 months post-Surgery (ng/ml) Mean ± SD	ANOVA (p-value)
<500 mls	1.54 ± 1.63		1.13 ± 1.54		1.42 ± 1.59	
>500 - 1000 mls	1.66 ± 1.29	0.51 (0.604)	1.18 ± 0.91	0.48 (0.620)	1.59 ± 1.26	0.69 (0.508)
>1000 mls	2.21 ± 1.30		1.69 ± 1.08		2.20 ± 1.38	

*ANOVA = Analysis of variance.

Table 8. Comparison of the effect of uterine artery occlusion during open abdominal myomectomy on Pre-surgery and Post-surgery anti-Mullerian Hormone levels.

Group	Mean ± SD (ng/ml)	t-test	p-value
Pre-Surgery AMH	1.67 ± 1.44		
2nd day Post-Surgery AMH	1.22 ± 1.24	1.64	0.105
3 months Post-Surgery AMH	1.59 ± 1.43	0.28	0.778

*T-test: Student t-test.

Table 9. Comparison of the effect of uterine artery occlusion during open myomectomy on second day and three months post-surgery Anti-Mullerian Hormone levels.

Group	Mean ± SD (ng/ml)	t-test	p-value
2nd day Post-Surgery AMH	1.22 ± 1.24		
3 months Post-Surgery AMH	1.59 ± 1.43	1.35	0.182

*T-test: Student t-test.

second day and three months after surgery. The average second-day post-surgery AMH level was 1.22 ± 1.24 ng/ml, rising to 1.59 ± 1.43 ng/ml three months later, almost matching the pre-surgery AMH value. However, no statistically significant difference in AMH was observed between the two groups (p = 0.182).

4. Discussion

Open abdominal myomectomy is the most common surgical management for symptomatic uterine fibroids in women with fertility concerns; however, it is associated with haemorrhage. A uterine tourniquet is frequently used during myomectomy to reduce blood loss by temporarily occluding the blood supply to the uterus and ovaries. This is thought to result in ischaemic reperfusion injury, which may impair ovarian function [1] [2] [11].

This study's mean pre-surgery Anti-Mullerian Hormone assay was 1.67 ng/ml, indicating normal ovarian reserve. The values after using a uterine tourniquet during myomectomy on the second day and three months later were 1.22 ng/ml and 1.59 ng/ml, respectively. The decrease in AMH level on the second post-surgery day could be due to ischaemia caused by the occlusion of blood vessels by the tourniquet. Although the AMH level decreased between pre-surgery and second-day values, this was not statistically significant. Similar findings have been reported by Chen *et al.* [18], Mehdizadehkash *et al.* [14], Sander *et al.* [16], and Farag *et al.* [21]. It did, however, differ from the findings of Aharon *et al.* [15], Brown *et al.* [19], Migahed *et al.* [20], and Wang *et al.* [22], who reported a significant decrease in AMH level. This disparity could be attributed to the earlier anti-Mullerian hormone assays performed on the first postoperative day, as well as the smaller sample sizes in these studies.

The tourniquet time for most of the participants ranged between 45 - 60 minutes, as advocated by Essone *et al.* [11]. However, there is no standard time for using a tourniquet during a myomectomy [11]. The mean pre-surgery AMH level for the 45 mins group was 1.22 ± 1.31, which was significantly lower than the 45 - 60 mins (1.78 ± 1.69), 60 - 90 mins (1.65 ± 1.05), and 90 - 120 mins (2.14 ± 1.60) groups. This significant reduction in the < 45 mins group was because most participants in that category were between 30 - 39 years when AMH values of 0.11 - 12.67 ng/ml are considered normal. Thus the < 45 mins AMH level is within normal limits.

The mean AMH levels were significantly lower on the second post-surgery day across the four tourniquet time groups, returning to near pre-surgery levels three months later. This could be because restoring blood to ischaemic tissues and recovering from ischaemic reperfusion injury may be insufficient on the second day after surgery but should be nearly complete three months later [1] [15].

This study found no statistically significant relationship between tourniquet time during open abdominal myomectomy and anti-Mullerian hormone levels. These results are consistent with Migahed *et al.* [20], and Aharon *et al.* [15]. This also supports Bulat's observation that the ovaries are resistant to ischemia-reperfusion damage even after prolonged ischaemia and that follicular reserve can function [23].

In terms of the effect of blood loss during open abdominal myomectomy on AMH level, the mean pre-surgery AMH level for the 500 mls blood group was slightly lower than for the 500 - 1000 mls group and significantly lower than for the > 1000 mls group. This is because most participants in the < 500 mls and 500 - 1000 mls blood loss groups were between 30 - 39 years when AMH values of 0.11 - 12.67 ng/ml are considered normal. On the second postoperative day, the AMH level was also found to be lower. It was observed that there was a steady decline in AMH levels with increasing blood loss, indicating that increasing blood loss at myomectomy worsens tissue hypoxia and ischaemia and may have an effect on ovarian reserve. However, this relationship was not statistically significant. This is consistent with the findings of Migahed *et al.* [20], and Aharon *et al.* [11].

The results of the study on the trend in anti-Mullerian hormone levels after open abdominal myomectomy revealed a decrease in the value of AMH on the second post-surgery day compared to the pre-surgery value; however, this difference was not statistically significant. This is similar to the report by Browne *et al.* [19]. It also agrees with Migahed *et al.* [20]. However, in the studies by Wang *et al.* [22], and Aharon *et al.* [15], the early decline in AMH levels was statistically significant, which may be explained by the smaller sample sizes used.

Furthermore, there was no statistically significant difference in AMH levels before and after surgery at three months. These findings are consistent with reports by previous research [14] [16] [19] [20] [21] [22]. However, this did not correlate with the findings of Browne *et al.* [19] who observed that AMH value decreased up to 18 months after myomectomy. The small sample size may have influenced their results.

The larger sample size of this study compared to previous studies is its strength. It was, however, a single-centre, quasi-experimental study without a control arm or randomisation. As a result, a larger sample size randomised multi-centre control trial should be conducted, which would be fully representative of the general population.

5. Conclusion

Although open abdominal myomectomy is a common treatment for symptomatic uterine fibroids, it is associated with haemorrhage. The use of uterine tourniquets during open abdominal myomectomy reduces blood loss significantly. According to the findings of this study, the use of a uterine tourniquet, its duration of use, and blood loss during open myomectomy had no effect on ovarian reserve. As a result, regardless of the duration of application, using a uterine tourniquet during open abdominal myomectomy is recommended.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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