Scientific Research Publishing

Open Journal of Obstetrics and Gynecology, 2026, 16(4), 587-595
https://www.scirp.org/journal/ojog
ISSN Online: 2160-8806
ISSN Print: 2160-8792

Associated Factors of Female Infertility in Patients with Uterine Fibroids in Yaoundé: A Case Control Study

Serge Robert Nyada[1,2*], Frédérique Gracia Malapa[1], Véronique Batoum Mboua[1,3], Christiane Nsahlaï[1,4], Michèle Mendoua[5], Cliford Ebong Ebontane[1,6], Isidore Tompeen[1,7], Pascale Mpono Emenguele[1,2], Vanina Ngono Akam[1,2], Valère Mve Koh[1,3]

[1]Faculty of Medicine and Biomedical Sciences, University of Yaoundé 1, Yaoundé, Cameroon
[2]Gynecological Endoscopic Surgery and Human Reproduction Teaching Hospital, Yaoundé, Cameroon
[3]Obst & Gyn Unit, University Teaching Hospital, Yaoundé, Cameroon
[4]Essos Hospital Centre, Yaoundé, Cameroon
[5]Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon
[6]Obst & Gyn Unit, Central Hospital of Yaoundé, Yaoundé, Cameroon
[7]Obst & Gyn Department, Gynaeco-Obstetrics and Paediatric Hospital of Yaoundé, Yaoundé, Cameroon
Email: *sergenyadar@yahoo.fr

How to cite this paper: Nyada, S.R., Malapa, F.G., Batoum Mboua, V., Nsahlaï, C., Mendoua, M., Ebong Ebontane, C., Tompeen, I., Mpono Emenguele, P., Ngono Akam, V. and Mve Koh, V. (2026) Associated Factors of Female Infertility in Patients with Uterine Fibroids in Yaoundé: A Case Control Study. *Open Journal of Obstetrics and Gynecology*, **16**, 587-595.
https://doi.org/10.4236/ojog.2026.164057

Received: March 6, 2026
Accepted: March 30, 2026
Published: April 2, 2026

Abstract

Background: Infertility is a major public health issue. Uterine fibroids have been found to be one of the causes of female infertility. Although controversies still exist regarding the link between uterine fibroids and infertility, it seemed important to carry out this study in order to determine the factors associated with the occurrence of infertility in women with fibroids in our settings. **Materials and Methods:** We conducted a case-control study in three hospitals in the city Yaoundé between January 2020 and December 2024. On one hand, patients with exclusive female infertility and uterine fibroids constituted the cases; on the other hand, patients with spontaneous pregnancy and/or who had given birth and who had uterine fibroids were controls. **Results:** We included 180 medical records, comprising 89 cases and 91 controls. Bivariate analysis revealed the following factors associated with an increased risk of infertility: age between 20 and 29 years (OR = 4.6 [1.7 - 12.3], p = 0.002); age ≥ 40 years (OR = 21.5 [7.2 - 64.1], p = 0.001); working in the informal sector (OR = 4.35 [1.69 - 11.19], p = 0.002); and having more than five uterine fibroids (OR = 8.9 [3.43 - 23.4], p = 0.001). A higher education level (OR = 0.1 [0.01 - 0.89], p = 0.04) was considered protective. No significant association was found with gynecological history, body mass index, fibroid size, or FIGO classification. After multivariate analysis, only age above 30 and having more than five fibroids were reported as increasing the risk of infertility. **Conclusion:** Being above 30 years

of age and having more than five uterine fibroids were factors associated with an increased risk of infertility.

Keywords

Female Infertility, Uterine Fibroids, Associated Factors, Yaoundé

1. Introduction

Fibroids are considered the most common benign uterine tumor in women, affecting between 20 and 25% of them [1]. Infertility is a public health issue with female, male, mixed, and idiopathic causes. Infertility, defined as the failure to achieve pregnancy after 12 months of unprotected sexual intercourse, can be a cause of distress and stigma. A previous study conducted in Cameroon found that 43.6% of infertility cases were due to female factors [2].

Although the relationship between uterine fibroids and infertility remains debated, several mechanisms may explain impaired fertility in the presence of fibroids. These mechanisms include uterine cavity distortion, impaired endometrial and myometrial blood supply, increased uterine contractility, impaired endometrial receptivity, and evidence of hormonal, paracrine, and molecular changes [3]. Moreover, fertility outcomes seem to be decreased in the presence of submucosal fibroids much more than intramural fibroids. Subserosal fibroids do not affect fertility outcomes [4]. Besides, the location, the size, and number of uterine fibroids may influence fertility [5]-[8].

The aim of this study was to evaluate the factors associated with the occurrence of infertility in women with uterine fibroids.

2. Materials and Methods

We carried out a case-control analytical study covering the period from January 2020 to December 2024 in three hospitals in the city of Yaoundé: the University Teaching Hospital, the Gynaeco-Obstetrics and Paediatric Hospital, and the Gynecological Endoscopic Surgery and Human Reproduction Teaching Hospital.

The study population consisted of premenopausal women with uterine fibroids. The cases comprised the records of patients with exclusive female infertility in whom the presence of uterine fibroids was reported. The controls comprised the records of patients who had conceived spontaneously and/or given birth and in whom the presence of uterine fibroids was reported. Primary and secondary infertility were combined. Exclusive female infertility refers to the evidence of female factors of infertility, such as uterine, tubal, or ovarian ones. Semen analysis of the partner was used to exclude male and mixed infertility. Cases and controls came from the same period of study.

The diagnosis of uterine fibroids was based on the results of pelvic ultrasound, saline hysterosonography, or pelvic MRI.

We matched cases and controls according to the healthcare facility. Sampling was consecutive, and the sample size was estimated using Schesselman's formula at 172, comprising 86 cases and 86 controls.

Data analysis was performed using SPSS version 27.0.1. The significance threshold was set at $p \leq 0.05$.

Prior approval was obtained from the Institutional Ethics Committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé 1.

3. Results

We included 180 records, comprising 89 cases and 91 controls.

Table 1 presents the sociodemographic characteristics of the study population. Factors associated with infertility were: age between 20 and 29 years (OR = 4.6 [1.7 - 12.3], p = 0.002); age ≥ 40 years (OR = 21.5 [7.2 - 64.1], p = 0.001); high level education (OR = 0.1 [0.01 - 0.89], p = 0.04); and being worker of the informal sector (OR = 4.35 [1.69 - 11.19], p = 0.002). No association was found with marital status and place of residence.

Table 1. Association between sociodemographic characteristics of the study population and infertility.

Variables	Cases N = 89 (%)	Controls N = 91 (%)	OR (CI 95%)	p-Value
Age (Years)				
[20 - 29]	6 (6.7)	33 (36.3)	0.36 [0.25 - 1.1]	0.54
[30 - 39]	40 (44.9)	47 (51.6)	**4.6 [1.7 - 12.3]**	**0.002**
≥40	43 (48.4)	11 (12.1)	**21.5 [7.2 - 64.1]**	**0.001**
Marital Status				
Married	47 (52.9)	53 (58.2)	2.3 [1.5 - 11.4]	0.75
Single	35 (39.3)	30 (33)	1.15 [0.6 - 2.13]	0.65
Cohabitation	7 (7.8)	8 (8.8)	1.08 [0.35 - 3.32]	0.88
Level of Education				
No Level	6 (6.7)	1 (1.1)	0.40 [0.01 - 2.8]	0.65
Primary	19 (21.3)	8 (8.8)	0.39 [0.04 - 3.8]	0.42
Secondary	28 (31.6)	24 (26.3)	0.19 [0.02 - 1.7]	0.14
Higher	36 (40.4)	58 (63.8)	**0.1 [0.01 - 0.89]**	**0.04**
Occupation				
Civil Servant	20 (22.4)	27 (29.7)	0.73 [0.28 - 1.64]	0.50
Private Sector	19 (21.4)	31 (34.2)	0.82 [0.36 - 1.86]	0.64
Informal Sector	30 (33.8)	9 (9.8)	**4.35 [1.69 - 11.19]**	**0.002**
Unemployed	20 (22.4)	24 (26.3)	1.12 [0.49 - 2.57]	0.78

Continued

Place of Residence				
Rural	12 (13.5)	6 (6.6)	2.2 [0.05 - 2.78]	0.40
Urban	77 (86.5)	85 (93.4)	0.45 [0.16 - 1.26]	0.131

Table 2 describes the gynecological past history of the study population. It was found that neither age at menarche, nor contraceptive use, nor alcohol consumption, nor a history of sexually transmitted infections were associated with the occurrence of infertility.

Table 2. Association between gynecological history of the study population and infertility.

Variables	Cases N = 89 (%)	Controls N = 91 (%)	OR (CI 95 %)	p-Value
Age at Menarche				
9 - 10	6 (6.7)	7 (7.7)	1.37 [0.35 -4.05]	0.72
11 - 14	69 (77.6)	74 (81.3)	1.08 [0.34 -3.39]	0.88
15 - 18	14 (15.7)	10 (11)	1.63 [0.4 -6.3]	0.47
Type of Contraception				
Hormonal	4 (4.5)	2 (2.2)	2.13 [1.58 - 3.59]	0.5
Non Hormonal	15 (16.8)	16 (17.8)	0.47 [0.07 - 2.94]	0.41
Alcohol				
No	74 (83.1)	80 (87.9)	0.67 [0.4 - 2.6]	0.07
Yes	15 (16.9)	11 (12.1)	1.47 [0.63 - 3.41]	0.36
Sexually Transmitted Infections				
Chlamydia	16 (18)	5 (5.5)	1.6 [1.22 - 11.4]	0.64
Hepatitis B	1 (1.1)	0	/	
Syphilis	1 (1.1)	4 (4.4)	0.12 [0.07 - 1.99]	0.14
HIV	4 (4.5)	2 (2.2)	2 [0.36 - 10.9]	0.43
Miscarriage				
Yes	35 (39.3)	31 (34.1)	1.25 [0.18 - 1.68]	0.305
No	54 (60.7)	60 (65.9)	0.79 [0.19 - 1.9]	0.22
Ectopic Pregnancy				
Yes	5 (5.6)	5 (5.5)	1.02 [0.86 - 5.3]	0.55
No	84 (94.4)	86 (94.5)	0.97 [0.21 - 2.83]	0.70

Regarding the clinical presentation (Table 3), body mass index, the presence of dysmenorrhea, menorrhagia, metrorrhagia, and pelvic pain were not associated with the occurrence of infertility.

A number of fibroids greater than 5 was significantly associated with infertility (OR = 8.9 [3.43 - 23.4]; p = 0.001); however, neither the location nor the size of the fibroids showed any link with the occurrence of infertility.

Table 3. Association between clinical description of the study population and infertility.

Variables	Cases N = 89 (%)	Controls N = 91 (%)	OR (CI 95 %)	p-Value
Body Mass Index (Kg/m²)				
Underweight	7 (7.9)	5 (5.5)	/	/
Normal	23 (25.8)	22 (24.2)	1.2 [0.25 - 6.01]	0.8
Overweight	21 (23.6)	41 (45)	2.5 [0.53 - 11.78]	0.24
Obesity	38 (42.7)	23 (25.3)	0.86 [0.18 - 4.06]	0.85
Dysmenorrhea				
Yes	42 (47.2)	28 (30.8)	2.01 [0.33 - 2.93]	0.07
No	47 (52.8)	63 (69.2)	0.49 [0.27 - 0.91]	0.025
Menorrhagia				
Yes	38 (42.7)	19 (20.9)	2.82 [0.35 - 3.40]	0.95
No	51 (57.3)	72 (79.1)	0.35 [0.18 - 0.68]	0.2
Metrorrhagia				
Yes	24 (27)	14 (15.4)	2.01 [0.45 - 2.80]	0.55
No	65 (73)	77 (84.6)	0.49 [0.23 - 1.03]	0.06
Pelvic Pain				
Yes	13 (14.6)	7 (7.7)	2.05 [0.28 - 2.48]	0.45
No	76 (85.4)	84 (92.3)	0.48 [0.22 - 1.43]	0.22
Number of Fibroids				
1 to 3	38 (42.7)	66 (72.5)	0.90 [0.39 - 1.48]	0.10
3 to 5	20 (22.5)	19 (20.9)	1.8 [0.86 - 3.84]	0.112
>5	31 (34.8)	6 (6.6)	**8.9 [3.43 - 23.4]**	**0.001**
Largest Fibroid				
<3 cm	19 (21.3)	31 (34.1)	2.6 [0.57 - 12	0.24
Between 3 and 6 cm	45 (50.6)	39 (42.8)	1.88 [0.92 - 3.84]	0.082
>6 cm	25 (28.1)	21 (23.1)	1.94 [0.86 - 4.38]	0.11

Continued

FIGO Classification				
FIGO 0	8 (9)	4 (4.4)	/	/
FIGO 1	11 (12.4)	5 (5.5)	1.5 [1.4 - 15.46]	0.73
FIGO 2	19 (21.3)	2 (2.2)	4.49 [3.1 - 65.22]	0.27
FIGO 3	18 (20.2)	21 (23.1)	0.45 [0.05 - 3.70]	0.41
FIGO 4	19 (21.3)	17 (18.7)	0.56 [0.4 - 3.93]	0.56
FIGO 5	25 (28.1)	7 (7.7)	2.16 [1.26 - 17.89]	0.47
FIGO 6	7 (8)	11 (12.1)	0.4 [0.03 - 3.42]	0.40
FIGO 7	5 (5.6)	7 (7.7)	0.33 [0.28 - 3.95]	0.38
FIGO 8	0	4 (4.4)	/	/
Hybrid	15 (16.8)	10 (10.1)	8 [3.6 - 10.91]	0.42

Table 4 shows that, after logistic regression, the factors associated with an increased risk of female infertility in women with uterine fibroids were: age over 30 (OR = 6.08), age over 40 (OR = 36.47), and a number of fibroids greater than 5 (OR = 6.23).

Table 4. Associated factors after logistic regression.

Variables	Cases N = 89 (%)	Controls N = 91 (%)	OR (CI 95 %)	p-Valeur
Age (Years)				
[30 - 39]	40 (44.9)	47 (51.6)	6.08 [1.5 - 24.45]	0.011
≥40	43 (48.4)	11 (12.1)	36.47 [1.04 - 188]	0.001
Number of Fibroids				
>5	31 (34.8)	6 (6.6)	6.23 [1.62 - 23.97]	0.001

4. Discussion

In our study, female infertility in patients with uterine fibroids was significantly associated with age: the risk was six times higher in the 30 - 39 age group, and 36.4 times higher in women aged above 40. These results are consistent with those of Van Heertum *et al*., who highlighted an increase in the prevalence of fibroids with age, combined with delayed motherhood, explaining the frequent association between advanced age, fibroids, and infertility [9]. In our study, we did not find a link with a history of sexually transmitted infections (STIs), probably due to the small proportion of patients reporting this history. However, STIs are known to cause infertility. The prolonged duration of infertility due to STIs could, in this case, explain the association between age and fibroids. In Cameroon, in the study

by Voundi-Voundi *et al*., patients with a history of sexually transmitted infection were more likely to consult for female infertility [2]. In a study conducted at the Nkoldongo District Hospital, the prevalence of Chlamydia trachomatis infection was found to be 11.4% in infertile women [10].

We observed that working in the informal sector increased the occurrence of infertility by 4.35 times in patients with fibroids. These results are consistent with those of Coulibaly *et al*., who found a predominance of women working in the informal sector, representing 42.69%, reflecting a context of precariousness that could influence both the understanding and management of infertility [1]. Assoumou Obiang *et al*. in Gabon noted that in 55.7% of cases, the women concerned were employed. This observation was explained by the fact that these women often prioritize their studies and thus postpone the birth of their first child. However, they are also more exposed to stress, a factor likely to promote the development of fibroids and infertility, compared to other women [11].

Although our results showed a protective effect conferred by a higher level of education, this relationship should be interpreted with caution. Indeed, the level of education could be only an indirect marker of higher socioeconomic status, which would allow better access to care and earlier intervention. Thus, the protective effect attributed to education could actually result from a set of more favorable social and economic conditions. This hypothesis was reaffirmed by Christophe Millien *et al*. in Haiti in 2021 [12].

In our study, the number of fibroids was found to be significantly associated with infertility. Indeed, women with more than five fibroids had a sixfold increased risk of infertility. However, this relationship may simply reflect age. Several studies have demonstrated an increase in the prevalence and number of fibroids with age, particularly after 35. This trend was often attributed to prolonged hormonal exposure to estrogen and progesterone [13] [14]. Although the location of the fibroids was not investigated in our study, the high number of fibroids could suggest tubal compression and, consequently, infertility. This link was suggested by Pritts *et al*., who showed that fibroids located near the tubal ostia could cause compression or mechanical distortion [4]. Laughlin-Tommaso *et al*. also reported that multiple fibroids, particularly in interstitial locations, increased the risk of tubal compression. However, he observed that fibroid location, rather than number, was more correlated with infertility [14].

In our study, neither FIGO classification nor fibroid size was associated with infertility. Coulibaly *et al*. also reported no association between fibroid location and infertility, which corroborates our results [1]. Conversely, other authors, such as Phaliwong *et al*., found that submucosal fibroids, when they distort the uterine cavity, directly alter the endometrial environment, which can compromise embryo implantation and increase the risk of miscarriage [15]. Similarly, several studies suggest that even without distortion of the uterine cavity, intramural fibroids can impair fertility. The meta-analysis by Sunkara *et al*. showed a significant reduction in the clinical pregnancy rate (RR = 0.85) and live birth rate (RR = 0.79). These

effects could be related to a disruption of uterine peristalsis or vascular flow, thus affecting implantation [16].

5. Limitations

This research carries some limitations. It was a retrospective study with possible residual confounding. In addition, other relevant factors like tubal status and ovarian reserve were not evaluated since there were many missing values in the files.

6. Conclusion

Factors associated with the occurrence of infertility in women with uterine fibroids were age over 30 and having more than five fibroids. FIGO classification and fibroid size were not associated with the occurrence of infertility.

Authors' Contributions

Frédérique Gracia Malapa drafted the first version. Serge Robert Nyada, Véronique Batoum Mboua, Christiane Nsahlaï, Michèle Mendoua, Cliford Ebong Ebontane, Isidore Tompeen, Pascale Mpono Emenguele, and Vanina Ngono Akam read and approved the final version. Valère Mve Koh supervised the research.

Conflicts of Interest

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

References

[1] Coulibaly, A., Sima, M., Traoré, M.S., Kanté, I., Dao, S.Z., Kone, K., *et al.* (2020) La place du fibrome utérin chez les patientes qui consultent pour infertilité au service de gynécologie obstétrique du CHU Point G. *Revue Malienne de Science et de Technologie*, **1**, 17-26.

[2] Voundi-Voundi, E., Toukam, M., Noa Ndoua, C., Nguefack-Tsague, G., Belinga, E., Ngono, V., *et al.* (2024) Prévalence et Facteurs Associés d'Infertilité d'Origine Féminine au Centre Hospitalier de Recherche et d'Application en Chirurgie Endoscopique et Reproduction Humaine (CHRACERH), Yaoundé, Cameroun. *Health Sciences and Diseases*, **25**, 6-11.

[3] Donnez, J., Taylor, H.S., Marcellin, L. and Dolmans, M. (2024) Uterine Fibroid-Related Infertility: Mechanisms and Management. *Fertility and Sterility*, **122**, 31-39. https://doi.org/10.1016/j.fertnstert.2024.02.049

[4] Pritts, E.A., Parker, W.H. and Olive, D.L. (2009) Fibroids and Infertility: An Updated Systematic Review of the Evidence. *Fertility and Sterility*, **91**, 1215-1223. https://doi.org/10.1016/j.fertnstert.2008.01.051

[5] Bendifallah, S., Brun, J. and Fernandez, H. (2011) Place de la myomectomie chez une patiente en situation d'infertilité. *Journal de Gynécologie Obstétrique et Biologie de la Reproduction*, **40**, 885-901. https://doi.org/10.1016/j.jgyn.2011.09.014

[6] Don, E.E., Mijatovic, V. and Huirne, J.A.F. (2023) Infertility in Patients with Uterine Fibroids: A Debate about the Hypothetical Mechanisms. *Human Reproduction*, **38**, 2045-2054. https://doi.org/10.1093/humrep/dead194

[7] Poncelet, C., Benifla, J.L., Batallan, A., Daraï, E. and Madelenat, P. (2001) Myome et

infertilité: Analyse de la littérature. *Gynécologie Obstétrique & Fertilité*, **29**, 413-421. https://doi.org/10.1016/s1297-9589(01)00154-0

[8] Somigliana, E., Reschini, M., Bonanni, V., Busnelli, A., Li Piani, L. and Vercellini, P. (2021) Fibroids and Natural Fertility: A Systematic Review and Meta-Analysis. *Reproductive BioMedicine Online*, **43**, 100-110. https://doi.org/10.1016/j.rbmo.2021.03.013

[9] Van Heertum, K. and Barmat, L. (2014) Uterine Fibroids Associated with Infertility. *Women's Health*, **10**, 645-653. https://doi.org/10.2217/whe.14.27

[10] Essome, M.C.N., Nsawir, B.J., Nana, R.D., Molu, P. and Mohamadou, M. (2016) Sero-Epidemiological Study of Three Sexually Transmitted Infections: Chlamydia Trachomatis, Hepatitis B, Syphilis. A Case Study Conducted at the Nkolndongo District Hospital in Yaoundé. *Pan African Medical Journal*, **25**, Article No. 244.

[11] Assoumou Obiang, P., Makoyo, O., Minkobame, Z.M.U.P., Eya'ama, R., Ntsame Mezui, J.E., Mewie, A., *et al*. (2024) Aspects épidémiologiques des femmes hospitalisées pour myomes utérins à Libreville. *Health Sciences and Diseases*, **25**, 95-100.

[12] Millien, C., Manzi, A., Katz, A.M., Gilbert, H., Smith Fawzi, M.C., Farmer, P.E., *et al*. (2021) Assessing Burden, Risk Factors, and Perceived Impact of Uterine Fibroids on Women's Lives in Rural Haiti: Implications for Advancing a Health Equity Agenda, a Mixed Methods Study. *International Journal for Equity in Health*, **20**, Article No. 1. https://doi.org/10.1186/s12939-020-01327-9

[13] Baird, D.D. and Dunson, D.B. (2003) Why Is Parity Protective for Uterine Fibroids? *Epidemiology*, **14**, 247-250. https://doi.org/10.1097/01.ede.0000054360.61254.27

[14] Laughlin-Tommaso, S.K. and Stewart, E.A. (2011) Uterine Fibroids and Reproductive Dysfunction: A Critical Review of the Evidence. *Fertility and Sterility*, **95**, 1048-1055.

[15] Phaliwong, P. (2020) The Effect of Myoma Uteri on Infertility. *Siriraj Medical Journal*, **72**, 443-450. https://doi.org/10.33192/smj.2020.60

[16] Sunkara, S.K., Khairy, M., El-Toukhy, T., Khalaf, Y. and Coomarasamy, A. (2009) The Effect of Intramural Fibroids without Uterine Cavity Involvement on the Outcome of IVF Treatment: A Systematic Review and Meta-Analysis. *Human Reproduction*, **25**, 418-429. https://doi.org/10.1093/humrep/dep396