

Epidemiology Of Uterine Fibroid Disease In Lebanon: A Case-Control Study

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Abstract

Background: Uterine leiomyoma (UL) are women's most common pelvic tumors, benign in nature, growing during reproductive age, and presenting with abnormal uterine bleeding or pelvic pain and pressure. Many risk factors may contribute to UL, such as family history, obesity, and early menarche. Despite the fact that UL symptoms may improve using many medical or surgical treatments, the health-related quality of life (HRQoL) is considerably affected by their presence. Based on all of the above, we conducted this study which is to the best of our knowledge, the first of its kind in Lebanon aiming to assess the risk factors of UL among the Lebanese population and provide an overview of the diagnostic methods, treatment modalities, and HRQoL among patients.

Subjects & Methods: This is an epidemiologic case-control retrospective study, of 668 women of reproductive age, of different nationalities living in Lebanon, divided into 167 cases and 501 controls, conducted between January 2016 and February 2018, in Beirut, Lebanon, in Rafic Hariri University Hospital (RHUH) and Makassed General Hospital (MGH), using charts, questionnaires, and telephone calls. The statistical program Statistical Package for the Social Sciences 19 (SPSS-19) was used for data analysis. A multivariate analysis was also done. Two-sided data analysis was employed and statistical significance was considered for a p-value of ≤ 0.05 .

Results: Risk factors of UL were older age (>40), early menarche, family history, oral contraceptives (OCP) use, high body mass index (BMI) (>29), and chronic diseases. Smoking and sports were protective factors. The highest effectiveness in diagnosis was attributable to pelvic ultrasonography (94.8% of cases), magnetic resonance imaging (MRI) (85.2% of cases), and hysteroscopy (77.8% of cases). Hysterectomy was the most used treatment method (83.8% of cases), followed by hysteroscopy (77.8%) and uterine artery embolization (UAE) (72.7%). Women with leiomyoma reported that their HRQoL is negatively affected by this condition.

Conclusion: This study showed many risk factors for UL, and the statistical significance of techniques for their diagnosis and treatment, in order to prevent their complications and decrease their impact on HRQoL.

Keywords: Uterine leiomyoma, Pelvic tumors, Risk factors, Lebanon, Epidemiology, Health related quality of life.

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Introduction

General overview

Uterine leiomyoma (UL) are smooth muscle cells benign tumors of the uterus [1]; macroscopically, they are round firm whitish tumors of the myometrium. They have distinct autonomy from their surrounding myometrium because of their thin outer connective tissue. This characteristic helps in resecting them easily during surgery. Microscopically, they are composed of aggregations of smooth muscle fibers, without high mitotic activity and without atypical forms. These characteristics differentiate leiomyoma from leiomyosarcoma. In addition, leiomyomas have a poor blood supply that predisposes them to necrosis and degeneration and thus to subsequent changes in their histologic pattern, considered as normal variants as long as no atypia is found [2]. Their growth is steroid-dependent [3,4], classified based on their location as subserosal, intramural and submucosal, with high collagen content conferring them their second nomination as fibroids [5,6].

Limited epidemiologic data is found worldwide as well as in Lebanon. Statistically significant results showed that they are the most encountered benign pelvic tumors in women diagnosed during reproductive age [3,4], the leading indication for hysterectomies in the USA [1,7], and one of the primary causes of hospital admissions for gynecological disorders [1], leading to high morbidity of reproductive age women. Despite that, little attention was conferred to them compared to malignant female tumors [3].

Risk factors

Risk factors of UL can be divided into different subtypes.

First, irreversible risk factors, include increasing age which leads to increased prevalence of leiomyoma, reaching a maximum around the forties followed by a decrease during perimenopausal years [8,9]; and family history which predisposes women to develop leiomyoma due to an

inherited genetic mutation [1,4].

Second, gynecologic risk factors include early menarche leading to prolonged exposure to reproductive hormones enhancing cellular divisions throughout the reproductive years [1,8], menopause after which post-women experience female sex hormone withdrawal explaining the shrinkage of the tumor at this age [1,8], and parity where nulliparous women are at increased risk to develop UL compared to multiparous women because pregnancy decreases the length of exposure to unopposed estrogens [1,8,10].

Shifting to general health conditions, obesity leads to increased conversion of circulating adrenal androgens to estrogens within the adipose tissue [7,8]; concerning OCP use, while a study published in 1971 suggested that OCPs may play a role in the development or growth of leiomyoma, other studies found that the risk of leiomyoma is reduced with longer periods of OCPs use and attributed this finding to the decreased unopposed estrogen exposure by the modifying effects of progesterones [11].

Current smoking has been associated in several studies with a reduced risk of UL [12,13], whereas alcohol consumption increased the risk of UL in a dose-dependent manner, and exercises practice protected against the condition in several studies [9,14].

Signs and Symptoms

Moving to the clinical aspects of the disease, bleeding is the most common presentation, due to excessive dilatation of the tumors' venules throughout the menstrual cycle and thus excessive blood loss [15,16]. Second, pelvic discomfort and dysmenorrhea can be due to severe enlargement of the uterus by the growing mass [16]. Infertility could also be a complication of UL due to several mechanisms including mechanical effect and uterine inflammation [16–18].

Diagnostic Methods

Concerning diagnosis, UL can be detected by findings of uterine enlargement, irregular

contour, or both on a pelvic exam [19] which is a part of the routine gynecologic examination. These findings should be characterized by further testing, which can be done by undergoing pelvic ultrasound (US), showing in the majority of cases the same echogenicity of UL compared to the myometrium with a peripheral vascular rim on Doppler views [19,20]. Other methods are hysterosalpingography which uses fluoroscopy to diagnose any anatomical cause of infertility in women [20], endometrial biopsy used mainly in differentiating between leiomyoma and leiomyosarcomas in case of menometrorrhagia [19], and hysteroscopy that is an endoscopic diagnostic and therapeutic method [20]. Concerning magnetic resonance imaging (MRI), it is useful when the leiomyoma location is unusual and when an acute complication of the tumor is present such as torsion or degeneration [19,20].

Management

Appropriate management of the condition is dependent on many factors such as the presenting symptoms and their severity, the volume and anatomic boundaries and placement of the tumor, and the patient's age and fertility plans.

Observation is one way of managing UL in high-risk surgery patients or if the fibroids are small in size and the patient is close to menopause [19,20]. The second modality is drug therapy, among which we cite non-steroidal anti-inflammatory drugs (NSAIDs), synthetic androgens, gonadotropin-releasing hormone (GnRH) agonists, GnRH antagonists, and antiprogestins [19,21].

The third way to treat fibroids is via minimally invasive techniques like uterine artery embolization [22,23], hysteroscopy, and Magnetic Resonance Imaging-Guided Focused Ultrasound [21].

Finally, surgical treatment can include hysterectomy [19,20] which is the only definite treatment of the condition, myomectomy, and endometrial ablation [19] used as an adjunct therapy to hysteroscopic treatment.

Complications

Anemia is the most commonly encountered complication of UL due to heavy bleeding that may be attributable to both microscopic and macroscopic abnormalities of the uterine vasculature, in addition to impaired endometrial hemostasis, or molecular dysregulation of angiogenic factors [24]. Infertility can be the presenting complaint of the patients as well as a complication of the condition [17]. Inferior vena cava compression is due to very large uterine fibroid leading to an increase in thromboembolic risk [25]. Urinary tract infections are commonly linked to pelvic pressure of the fibroid on the urinary bladder leading to urine stagnation and subsequent infection [26].

Health-Related Quality of Life (HRQoL)

Finally, the assessment of UL's impact on women is challenging. A wide range of symptoms can be experienced due to uterine fibroids, which necessitated to develop the Uterine Fibroid Symptom QoL questionnaire (UFS-QoL), which has been validated to measure symptoms specific to uterine fibroids and health-related quality of life (HRQoL) for UL. An eight-item Symptom Severity scale and 29 HRQoL items divided into six subscales constitute this questionnaire. Greater symptoms are indicated by a higher symptom severity score while better HRQoL is indicated by higher HRQoL subscale scores [27,28].

Based on all of the above, UL represents a common disease among women with considerable effect on their daily life and an important socio-economic and medical burden. According to these facts, a first-of-its-kind Lebanese epidemiologic study was necessary in order to assess the risk factors of UL among the Lebanese population and provide physicians with scientific evidence about them.

Methods

Study design

An epidemiological, case-control, retrospective study about uterine fibroid

disease was conducted from January 1, 2016, to February 28, 2018, in two selected public hospitals in Beirut, Lebanon (Rafic Hariri University Hospital-RHUH and Makassed General Hospital- MGH).

Study population

Sample size

Epi-info 7 system was used to estimate the sample size; a 4:1 control-to-cases ratio was followed, with a level of confidence of 95%, a marginal error of 5%, and a study power of 80%. Thus, the sample size was 358 participants after calculation; 10% was added for possible non-responses, thus a final number of 399 participants (99 cases and 297 controls) was estimated to be the final sample size. The sample size was increased to 668, including all eligible subjects (167 cases and 501 controls). Inclusions and exclusions criteria for subjects were presented in Table 1.

Data collection

Study subjects were selected as follows: consecutive enrollment in the study of the diagnosed cases was done. Four controls were then selected immediately by simple random sampling technique for each diagnosed case.

Questionnaire

Data collection was done by face-to-face interviews for controls and by phone for cases (not easily reachable after hospital discharge) using the pretested questionnaire. The questionnaire initially in English was translated into the country's primary language (Arabic). The questionnaire included informed consent, socioeconomic & demographic characteristics, general health issues, pelvic symptoms and signs, diagnostic modalities adopted, management undergone by the participants, and HRQoL assessment using an international score.

Chart review

A standardized data set was adopted to collect demographic characteristics (age, sex, comorbidities, risk factors, etc),

Table 1: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Women between 18-51 years old who are in reproductive age, and are not pregnant	Younger than 18 or older than 51 years old
Diagnosis of uterine fibroids documented by a pelvic ultrasound for the cases	Acute internal or infectious disease
Intact uterus (i.e. no previous hysterectomy)	History of major depression or post-traumatic stress disorder
	Past history of other mental health disorders (e.g., schizophrenia, bipolar disorder) (information may be unreliable due to possible psychological lability)
	Any past history of cancer treated by radiation or chemotherapy
	Pregnant women or breast feeding women

diagnosis, treatment, and outcomes from medical charts.

Telephone interviews

Fibroid disease is based on imaging for definitive diagnosis, so basic data were collected from the charts. In case of missing data, and in order to complete the questionnaire, especially the part concerning the quality of life, the participants were contacted by phone (via their number collected from the charts) in order to decrease bias as much as possible.

Ethical considerations

It is an epidemiological study that needs an Institutional Review Board waiver. The participant's privacy has been protected.

Confidentiality and anonymity were respected for all the information collected. The data has been destroyed after the transcribing process. There were safeguards in place to protect participants' confidentiality. Each participant in the study signed a written informed consent.

Statistical analysis

The Statistical Package for the Social Sciences software (Version 19.0. Armonk, NY: IBM Corp) was used for data analysis. Data were described using frequencies (N), percentages (%), means, and standard deviations. Absolute number and percentage reported categorical variables. The association between categorical variables was determined using Chi-square distribution. The t-test for independent samples was used to assess the differences in the average value of the numeric variables. All analyses were two-sided; a multivariate analysis was done. Note that an Odd's ratio (OR) < 1 indicates a protective effect of the studied factor, while an OR > 1 indicates that the studied factor increases the risk of fibroids' occurrence. A p-value of ≤ 0.05 defined statistical significance.

Results

Demographic variables results are as follows: the cases' mean age was 40.62 (± 0.59) years while the mean age of controls was 29.8 (± 0.38) years ($p < 0.001$). A proportion of 70.7% of the cases was single while 76.8% of the controls were married. ($p < 0.001$)

General health issues data are presented in Table 2. First, concerning weight and daily routine, the BMI mean was 28.98 (± 0.38) and 23.91 (± 0.18) for the cases and controls, respectively ($p < 0.001$).

Concerning smoking, 28.7% of the cases are smokers with a mean number of 14.81 (± 1.22) cigarettes/day, compared to a percentage of 65.9% among controls and a mean of 19.20 (± 0.58) cigarettes/day ($p < 0.001$ and = 0.007 respectively). As for sports, 20.4% of cases were sports practitioners compared to 75.4% among controls ($p < 0.001$).

Second, regarding the gynecologic aspect of the participants' life, 71.3% of the cases had gynecological problems compared to a percentage of 24.6 in the controls ($p < 0.001$). Mean age at menarche was 11.13 (± 0.13) and 13.82 (± 0.07) respectively among cases and controls ($p < 0.001$); a proportion of 6% of cases were menopausal compared to a percentage of 2.4% among controls ($p < 0.001$). OCPs were taken by 71.3% of cases and 24.6% of controls ($p < 0.001$).

Third, concerning past medical and family history, 74.9% of the cases had a positive family history of the disease compared to 20.4% among controls ($p < 0.001$). Among the cases, 56.9% complained of chronic diseases, compared to 29.9% for controls ($p < 0.001$ for both).

Concerning the diagnostic methods, their percentage of use is shown in Figure 1, and their effectiveness in diagnosis in Figure 2. The effectiveness in diagnosing was assessed in terms of the ability of each method to confirm the presence of uterine fibroid. Pelvic US accounted for 92.2% of the methods used for diagnosis of the condition and was effective in that purpose in 94.8%. 84.4% of cases underwent Pap smear but it was effective only in 2.1% in the diagnosis. A proportion of 5.4% of cases used hysteroscopy with an effectiveness of 77.8%.

Concerning the management procedures, their percentage of use is shown in Figure 3, and their effectiveness in Figure 4. The effectiveness of the methods was assessed in terms of decreased symptom severity or the non-recurrence of symptoms after treatment for a period of six months.

Hysterectomy accounted for 44.3% of the methods used for the treatment of the condition and was effective in that purpose in 83.8%. 100% of cases tried observation but it was effective in 9% only. 5.4% of cases underwent hysteroscopy with an effectiveness of 77.8%.

Table 2. Sociodemographic and General Health Characteristics

Characteristic	Confirmed diagnosis of fibroids		p-value
	Yes	No	
Total Number	167	501	
BMI (kg/m²)	28.98±0.38	23.91±0.18	<0.001
Gynecological problems n (%)	119 (71.3%)	123 (24.6%)	<0.001
Smoking n (%)	48 (28.7%)	330 (65.9%)	<0.001
Cigarette number	14.81±1.22	19.20±0.58	0.007
Alcohol n (%)	15 (9%)	46 (9.2%)	0.938
Drinks number	2.6±0.32	2.2±0.14	0.28
Exercise n (%)	34 (20.4%)	378 (75.4%)	<0.001
Type of exercise n (%)			0.842
Weight lifting	5 (14.7%)	55 (14.6%)	
Jogging-running-hiking	18 (52.9%)	191 (50.5%)	
Swimming-biking	4 (11.8%)	54 (14.3%)	
Basketball-tennis-football	3 (8.8%)	50 (13.2%)	
Others	4 (11.8%)	28 (7.4%)	
Practice / week	2.55±0.19	2.84±0.07	0.274
Diet n (%)			0.169
Omnivorous	163 (97.6%)	466 (93%)	
Others	4 (2.4%)	35 (7%)	
Age of menarche (year)	11.13±0.13	13.82±0.07	<0.001
Menopause n (%)	26 (15.6%)	12 (2.4%)	<0.001
Age of menopause (year)	46.84±0.36	47.41±0.48	0.369
OCP use n (%)	119 (71.3%)	123 (24.6%)	<0.001
Family history n (%)	125 (74.9%)	102 (20.4%)	<0.001
Endocrine disturbances n (%)	76 (45.5%)	212 (42.3%)	0.47
Type of endocrine disease n (%)			<0.001
Diabetes	6 (7.9%)	145 (68.4%)	
Hypothyroidism	59 (77.6%)	19 (9%)	
Hyperthyroidism	6 (7.9%)	14 (6.6%)	
Others	5 (6.5%)	34 (16%)	
Chronic diseases n (%)	95 (56.9%)	150 (29.9%)	<0.001

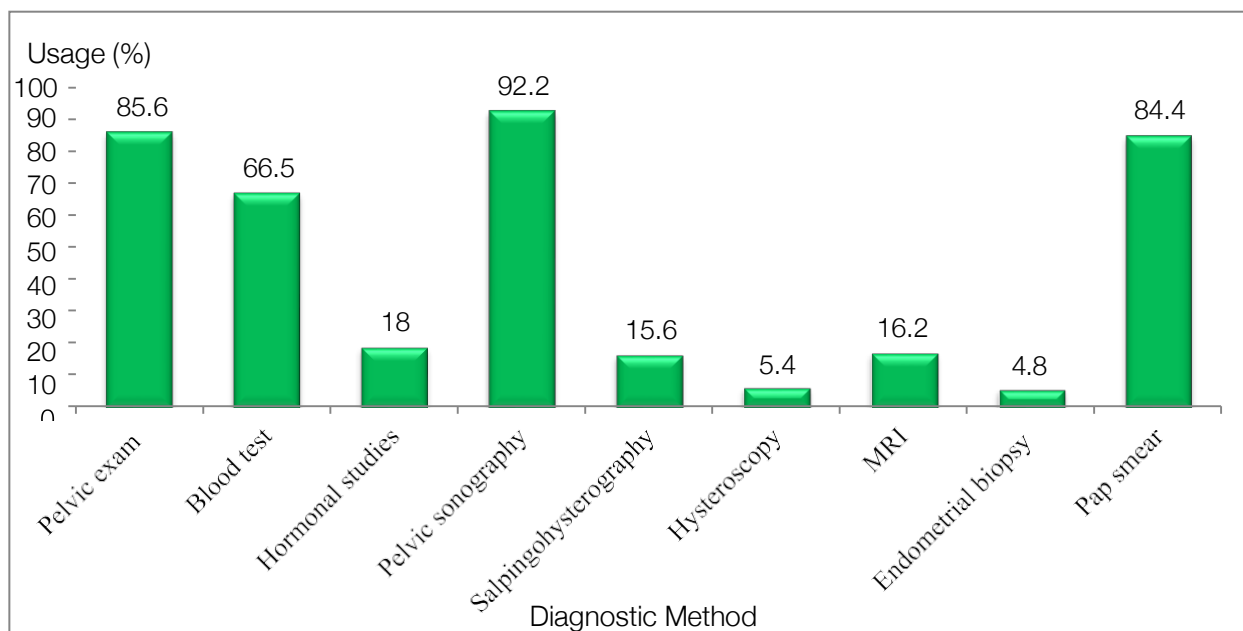


Figure 1: Methods Used in Fibroid's Diagnosis

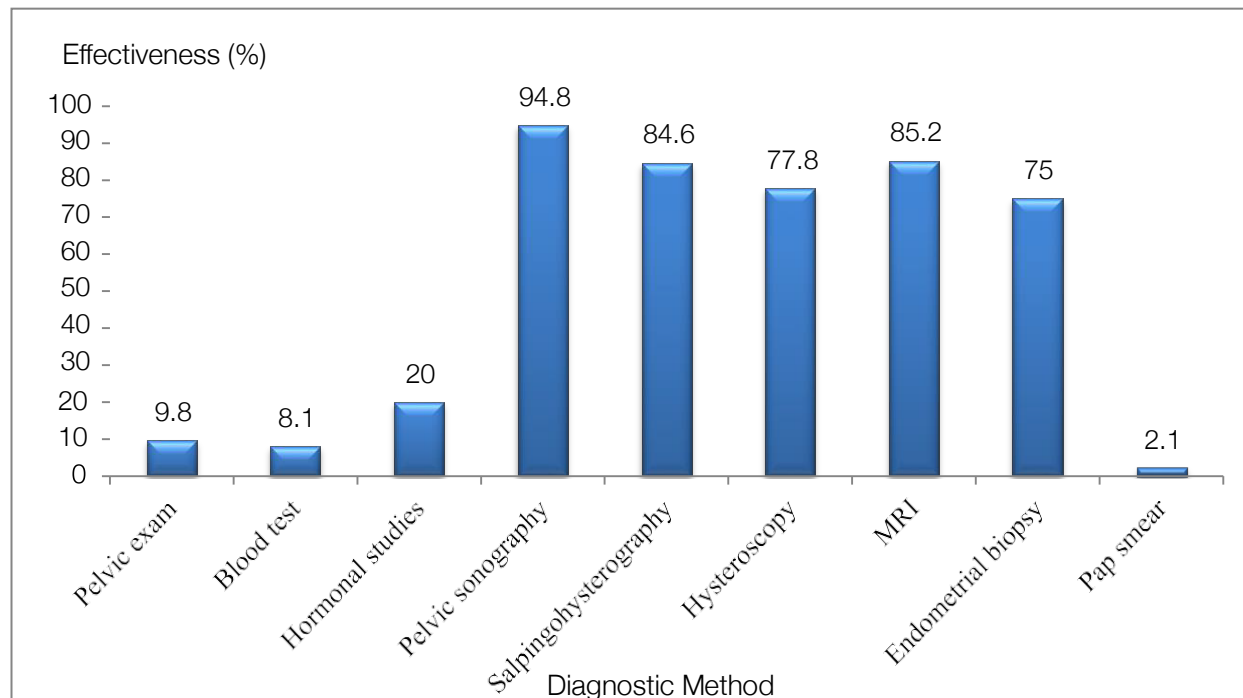


Figure 2: Effectiveness of Diagnostic Methods in Fibroid's Diagnosis

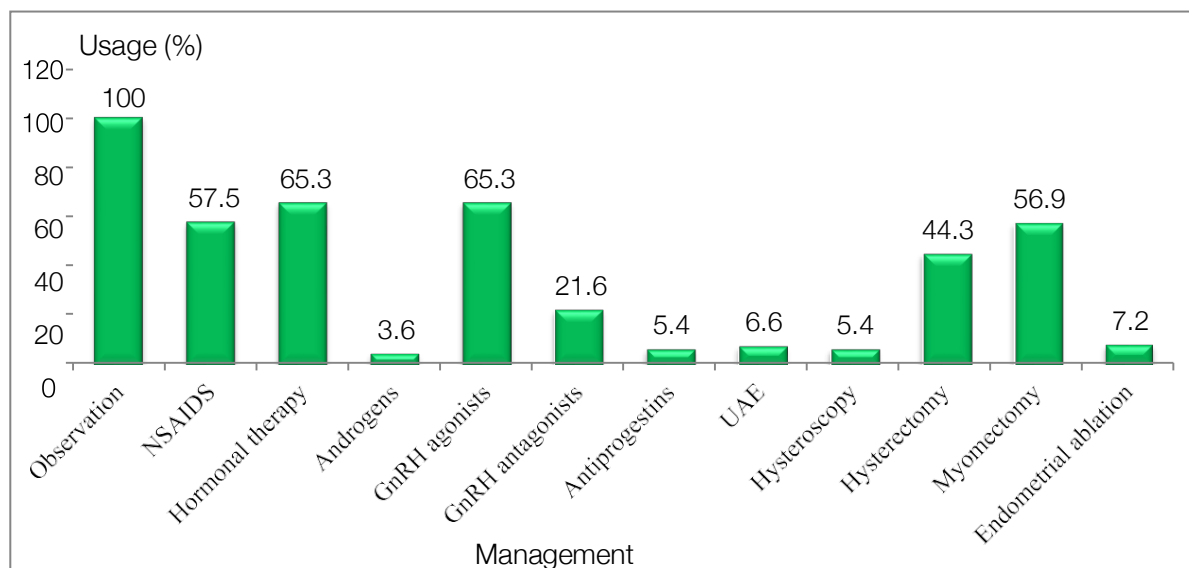


Figure 3: Procedures Used in Fibroid's Treatment

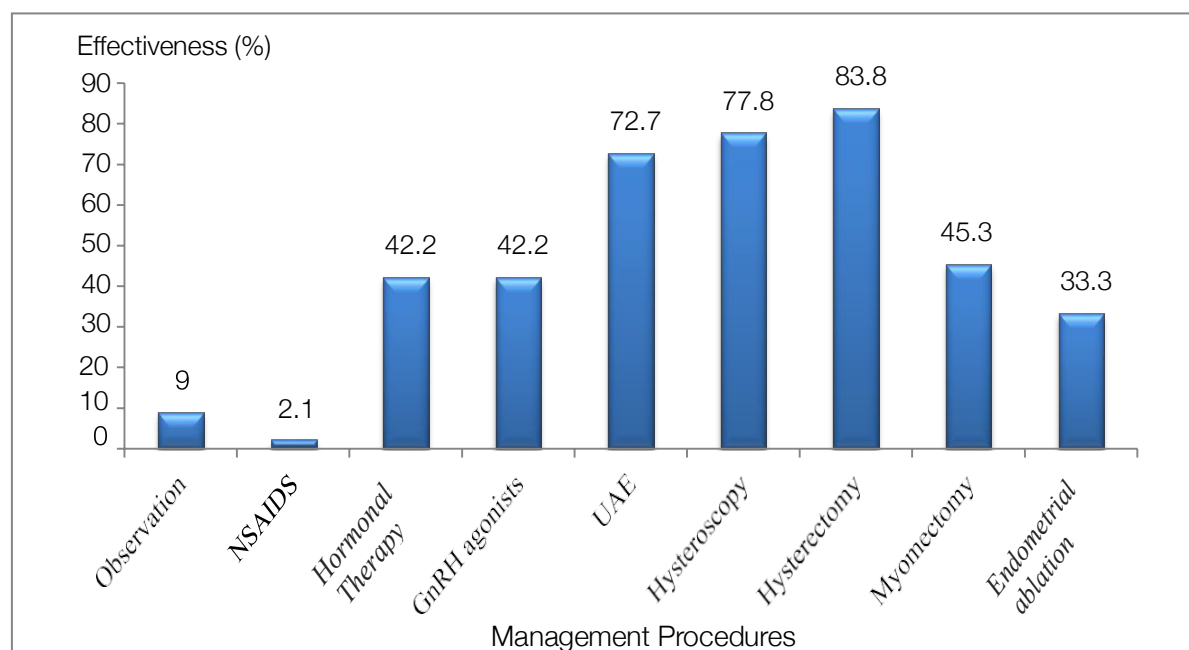


Figure 4: Effectiveness of Procedures in Fibroid's Treatment.

Symptoms severity among participants was assessed. Many symptoms including heavy bleeding, irregular menstrual periods, pelvic pain or pressure, and urinary or bowel symptoms, were reported in a higher percentage around 87% among cases in comparison with controls 3.6% ($p < 0.001$).

The complications of fibroids among cases and their percentages showed that anemia accounted for the highest percentage of complications in cases (80.2%), while inferior vena cava compression was the least common complication with a percentage of 34.1%.

The Uterine Fibroid Symptom-QoL questionnaire (UFS-QoL) was used in the assessment of the impact of fibroids on the perceived quality of life (QoL). The mean UFS-QoL Symptom Severity subscale indicated a score of 82.35 for women who suffered from UL versus 15.28 for women who didn't (p -value < 0.001). The UFS-QoL HRQoL subscale scores ranged from 17.55 on activity (p -value < 0.001) to 17.81 on self-consciousness and sexual function for women with UL (p -value < 0.001) compared to those for women without UL that ranged from 78.91 on sexual function (p -value < 0.001) to 82.24 on activity (p -value < 0.001), with a HRQoL total score of 17.68 and 80.79 respectively (p -value < 0.001). Greater symptoms were indicated by higher Symptom Severity scores while a better HRQoL was reflected by higher HRQoL subscale scores.

A multivariate analysis was also done. Age (OR = 1.14; 95% confidence interval (CI) = 1.07-1.20), BMI (OR = 1.4; 95% CI = 1.25-1.58), early menarche (OR = 2.1; 95% CI = 1.62-2.73), oral contraceptives use (OR = 8.37; 95% CI = 3.04-23.03), family history of the disease (OR = 36.69; 95% CI = 12.59-125.18) and coexistence of chronic diseases (OR = 11.3; 95% CI = 3.85-33.20), recorded odd's ratios > 1 , all for a p -value < 0.001 , considering them as risk factors of the disease. On the other hand, comparing married and single status showed an odd's ratio of 0.15 (95% CI = 0.05-0.47; $p=0.001$), and exercise practice showed an odd's ratio

of 0.078 (95% CI = 0.03-0.24; $p<0.001$), leading to their classification as protective factors.

Discussion

Uterine leiomyomas are the commonest benign tumors of the pelvis; they cause significant morbidity for reproductive-age women. Despite that, little attention was conferred to them compared to common female malignant tumors.

To begin with, we found that 40.62 years old is the average age of women having fibroid, close to two other studies' results [29] and slightly higher than the mean of 31.9 years old in an epidemiologic study conducted in Ghana [30].

Little data was found concerning marital status: in our study, we found that the majority of our cases were single contradicting the findings in a study conducted on Nigerian women where 93.5% of the patients were married [31].

A mean BMI of 28.98 was found among the cases, higher than the mean BMI of 23.91 of the controls, with an odds ratio of 1.4. In a review of UL epidemiology [12], results showed that the risk of UL development is associated with obesity and diabetes mellitus. In addition, a statistically significant higher BMI in women with UL was found in the Finnish twin cohort study. However, no association was found between BMI and the risk of UL in the Chiaffarino et al. study, conducted in Italy in 2016 [12].

In this study, we reported a lower incidence of smoking in the cases compared to the control group. While the role of smoking in promoting UL is still controversial between a protective effect and no effect at all [1,8,12].

Sports practice is a protective factor in our study (OR = 0.076) going with results while reviewing the literature [12].

Many studies established an inverse relationship between age at menarche and the risk of developing UL [12,20]. These findings were compatible with our study results: for a significant p -value ($p<0.001$), the mean age at menarche was 11.13,

younger than the mean age of menarche of our controls (13.82 years old) [32].

In our study, a higher percentage of OCP use was noted among cases, with an OR of 8.37. The relation between OCPs use and uterine fibroids development is a subject of debate: studies have shown reduced, similar, and increased risks of fibroids among past and current users of oral contraceptives relative to non-users [1,12]. This may depend on the type of OCP studied and the age of initiation of its use among the population studied with racial differences between populations, too.

Concerning family history, similar results were present between our study and other ones [1]: some studies showed an increased risk of 2.5 times in first-degree relatives of women having the condition [8]. Studies conducted on twins and genetic studies confirmed the same result too [12].

Shifting to the diagnosis, all the results were compatible with other studies' findings: the pelvic exam is usually the first test undergone, thus reserving a high percentage of use among the cases (85.6%), although it has relatively low effectiveness as a definitive diagnostic method. Thus, the pathology has to be confirmed by other tests [29,32].

This fact makes ultrasonography a suitable initial test and the most used imaging technique due to its low cost, availability, and absence of radiation exposure [8].

MRI was used in a lower percentage than in the US in our study. In general, it is used for its ability to determine precisely fibroid number and size mainly in preoperative concerns [8], but its use is still limited compared to other methods due to its high cost and time consumption.

As for hysteroscopy, it is both a diagnostic and therapeutic method: it was used in 5.4% of the cases in the diagnosis and 65.3 % in the treatment and it was effective in 77.8% for both. Its sensitivity and specificity were estimated by a study conducted in the USA in 2007 and were 82% and 87%, respectively [8].

Concerning management, observation was adopted in 100% of our cases and it was effective in 9% of cases in reducing the symptoms. It was shown in one study that untreated UL regression occurs in 3% to 7% of premenopausal women over a period of 3 to 6 months [33].

Medical treatment includes, first, hormonal therapy, used in our study in 65.3% of cases and was effective in 86.5% in the management of uterine fibroids in terms of mitigating the symptoms and ameliorating the quality of life, which goes with many studies' result [20,33], and second, NSAIDs, which, despite their low effectiveness of 2.1% in the management of fibroids, they are used in as much as 57.5% of cases due to their availability and low-cost [33].

Uterine artery embolization was used in 6.6% of the cases and was effective in 72.7%. It is mainly used in women who need to preserve their fertility and reduce hysterectomy procedure complications; although a systematic review concluded that the evidence for this assertion was weak [1,33].

In women who require to preserve their fertility and have submucosal leiomyomas, the preferred surgical procedure is myomectomy. However recurrence rates following myomectomy range from 40 to 50 percent [34] which explains its proportion of effectiveness in our study (45%).

Finally, hysterectomy was the most effective method (efficacy of 83.8%) in our study because it provides a final solution for women who suffer from leiomyomas symptoms and don't need to preserve their fertility. Similar results are available in other studies [33].

As for the symptomatology, the severity was greater in cases than in controls with bleeding being the most common symptom. These findings were similar to those in the literature review [29].

Going briefly through the complications, our results were all compatible with other studies: anemia was the most common complication, followed by urinary tract

infection, infertility, and inferior vena cava compression [17,26,35].

Our final point is to stress on the quality of life scoring system: the mean UFS-QoL Symptom Severity subscale score was 82.35 for women who suffered from UL versus 15.28 for women who didn't ($p < 0.001$). Other studies also showed that women with UL reported that the impact of fibroids ranged from moderate to very important impact [27,28,35]. The UFS-QoL HRQoL subscale scores ranged from 17.55 on activity ($p < 0.001$) to 17.81 on self-consciousness and sexual function for women ($p < 0.001$). Higher Symptom Severity scores designate greater symptoms while higher HRQL subscale scores show better HRQoL.

Study limitations

This study has faced several inevitable limitations, although it has achieved its aim. It covered only the capital city of Lebanon (Beirut), with only two centers (RHUH and MGH) thus it included only a small region of the country. This restricts the representative power for a wider population and the ability for external validation and generalization leading to a selection bias.

There is also a possibility of information bias since lots of information was recorded based on women's reported risk factors, symptoms, and quality of life; however, this bias is only expected to underestimate the associations we found. Also, a recall bias may be found due to cases' data collection by phone.

Finally, additional studies are necessary to confirm our findings.

Conclusion

This study reached its objective in determining fibroid risk factors, such as age older than 40 years old, early menarche, positive family history of the disease, OCP use, high BMI, and chronic diseases. Smoking and sports practice, however, were noted to be protective factors against the condition.

In addition, the study was able to determine

the different clinical presentations of the disease such as severe bleeding, irregular cycles, and pelvic pressure.

Pelvic US, pelvic MRI, and hysteroscopy were the most effective methods in the diagnosis of the disease, whereas hysterectomy, hysteroscopy, and UAE were the most effective methods in the treatment of the condition.

Therefore, hysteroscopy can be used as both a diagnostic and therapeutic method for uterine fibroids. UAE is beneficial in the management of the disease as a minimally invasive technique that also preserves fertility.

Fibroids had a significantly negative impact on the quality of life of patients in terms of higher levels of discomfort, and greater negative effects on sexual function and personal life. Thus, encouragement of early diagnosis, intervention, and adequate treatment of the condition help in improving the overall life of women and prevent the medical and economic burden of their possible complications.

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