International Journal of Biomedicine 11(4) (2021) 515-518
http://dx.doi.org/10.21103/Article11(4)_OA18

ORIGINAL ARTICLE

Obstetrics and Gynecology

INTERNATIONAL JOURNAL OF BIOMEDICINE

Prevalence of Uterine Fibroids in Women in Eastern Siberia: A Cross-Sectional Study

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Abstract

The objective of this study was to determine uterine fibroids (UF) prevalence in the unselected (medically unbiased) female population in the Eastern Siberia region, Russia, and to evaluate the significant risk factors.

Methods and Results: The study included 2389 women aged from 18 to 80 yrs (mean age of 42.8±11.9 yrs). Subjects were evaluated consecutively by means of questionnaires, anthropometry, vital signs, gynecological examination, and pelvic ultrasound. We demonstrated 26.41% UF prevalence in the unselected female population from Eastern Siberia. We found that the single nodules predominate among all fibroids, with the types 3–5 and the size of either ≤1 cm or ≥4 cm as the most frequent variants. Our study confirmed that the prevalence of fibroids increases with age. The incidence of fibroids is significantly lower in women with the age at menarche of 15 years. We also have found that a BMI of more than 25 kg/m^2, more than 4 pregnancies, and late menopause are risk factors for the development of fibroids.(**International Journal of Biomedicine. 2021;11(4):515-518.**)

Key Words: uterine fibroid • epidemiology • risk factors

For citation: Atalyan AV, Suturina LV, Nadeliaeva IG, Lazareva LM, Sharifulin EM, Danusevich IN. Prevalence of Uterine Fibroids in Women in Eastern Siberia: A Cross-Sectional Study. International Journal of Biomedicine. 2021;11(4):515-518. doi:10.21103/Article11(4)_OA18

Introduction

The most common neoplasms affecting women's health are uterine fibroids (UFs), which can cause significant morbidity and may adversely impact fertility.[1-10] Currently, only limited data are available concerning the prevalence and clinical issues of UFs in Russia.[11,12]

The most relevant studies on the risk of UFs consider age, race, endocrine disruptors, obesity, and lifestyle, as well as genetic, reproductive, and hormonal factors, as significant predictors. Nevertheless, more studies are needed to further understand UF biology and risk factors to clarify the etiopathogenesis of this disease. [1,13-15]

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The objective of this study was to determine UF prevalence in the unselected (medically unbiased) female population in the Eastern Siberia region, Russia, and to evaluate the significant risk factors.

The primary study aim was to collect data concerning the prevalence of UFs in the female population of the Eastern Siberia region, and the type, quantity, and size of the myomas. The secondary study aim was to analyze the association between the patient's age and the type, quantity, and size of UFs, as well as between the frequency of the UFs and BMI, parity, age at menarche, menopause presence and age.

Material and Methods

We performed a multicenter, institution-based, cross-sectional study in Irkutsk Region and the Burjat Republic (Russia) during 2016-2019. The study included 2389 women aged from 18 to 80 yrs (mean age of 42.8±11.9 yrs). All

women were stratified by age groups (≤25, 26–30, 31–35, 36–40, 41–45, 46–50, 51–55, 56–60, 61–65, and ≥66 years). The participants for this study were recruited during an obligatory, early, medical employment assessment.

Exclusion criteria were as follows: the subject is not willing to comply with all study procedures and be available for the duration of the study; anything that would place the individual at increased risk or preclude the individual's full compliance with or completion of the study; unwillingness to participate or difficulty understanding the consent processes or the study objectives and requirements; history of hysterectomy, bilateral oophorectomy, endometrial ablation, or uterine artery embolization.

Subjects were evaluated consecutively by means of questionnaires, anthropometry, vital signs, gynecological examination, and pelvic ultrasound. Pelvic ultrasound was performed by 3 experienced specialists with the appropriate intra/inter-observer variations, using Mindray M7 (MINDRAY, China), a transvaginal probe (5,0-8,0 MHz) or transabdominal probe (2,5-5,0 MHz).

The following parameters were evaluated: (1) gynecological history (menarche, parity, live-births, abortions, missed abortions, use of hormonal or other contraceptives, gynecological operations); (2) height and weight, body mass index (BMI); (3) ultrasound measurement of the myomas: location, number, size. The UF volume was determined by the following formula: (length × width × height × 0.457)/1000.

We used the initial data derived from the electronic data capture system REDCap.[16] The data were processed in a manner enabling the evaluation utilizing the statistical software STATISTICA version 12 (StatSoft, USA). The frequencies of categorical variables were compared using Pearson's chi-squared test or Fisher's exact test, when appropriate. A probability value of $P<0.05$ was considered statistically significant.

The study was approved by the Ethics Committee of the Scientific Center for Family Health and Human Reproduction Problems. Written informed consent was obtained from each participant.

Results and Discussion

The main results of our study population are shown in Table 1. As presented, UFs were found in 631(26.41 %) of the total 2389 women included in the present study.

In the majority of patients with fibroids (57.9%), ultrasound examination revealed only one single nodule, 19.1% had 2 fibroids, 11.5% had 3, and the same number (11.5%) had 4 or more (Fig.1).

In the present study, fibroids were classified according to their type.[17] The nodules types 3–5 predominated in all age groups (76.2%), subserous fibroids (types 6–7) were found in 41.4% and only 6.3% of cases had submucous (types 0–2) (Fig.2). For the analysis of the size of myomas, the maximum node in the case of multiple myomas was taken into account. An equal number (35% each) of all fibroids was <1cm and >4cm; 14.5% of the nodules were from 1 cm to 2 cm, 7.9% from 2 cm to 3 cm, and 7.1%, from 3 cm to 4 cm (Fig.3).

Table 1.
Characteristics of the study population

	Frequency N=2389	Percentage	Fibroids		P-value	OR, 95% CI
			Yes N=631	No N=1758		
Age, years	2389/0*				<0.001	
≤25	161	6.74	2 (1.24)	159	<0.001	0.032 [0.008;0.129]
26-30	235	9.84	5 (2.13)	230	<0.001	0.053 [0.022;0.129]
31-35	349	14.61	33 (9.46)	316	0.001	0.252 [0.174;0.365]
36-40	361	15.11	73 (20.22)	288	0.004	0.668 [0.507;0.879]
41-45	331	13.86	104 (31.42)	227	0.026	1.331 [1.034;1.713]
46-50	292	12.22	124 (42.47)	168	<0.001	2.315 [1.798;2.980]
51-55	246	10.30	113 (45.93)	133	<0.001	2.665 [2.036;3.490]
56-60	242	10.13	101 (41.74)	141	<0.001	2.185 [1.662;2.873]
61-65	103	4.31	46 (44.66)	57	<0.001	2.347 [1.573;3.499]
≥66	69	2.89	30 (43.48)	39	0.001	2.200 [1.355;3.573]
BMI	2386/3*				<0.001	
<25	940	39.40	163 (17.34)	777	<0.001	0.441 [0.361;0.540]
25-29.9	772	32.36	236 (30.57)	536	0.001	1.368 [1.130;1.655]
30-34.9	428	17.94	145 (33.88)	283	<0.001	1.560 [1.246;1.954]
≥35	246	10.31	85 (34.55)	161	0.002	1.549 [1.170;2.050]
Age at menarche, years	2385/4*				0.045	
≤11	206	8.64	55 (26.70)	151	0.934	1.014 [0.734;1.400]
12	474	19.87	134 (28.27)	340	0.317	1.121 [0.896;1.404]
13	661	27.71	193 (29.20)	468	0.060	1.211 [0.992;1.478]
14	689	28.89	172 (24.96)	517	0.292	0.897 [0.732 1.098]
15	208	8.72	38 (18.27)	170	0.005	0.597 [0.415;0.859]
≥16	147	6.16	39 (26.53)	108	0.983	1.004 [0.688;1.465]
Menopause	2375/14*					
yes	669	28.17	281(42.00)	388	<0.001	2.836 [2.337;3.442]
no	1706	71.83	347(20.34)	1359		
Age at menopause, years	667/2*				0.010	
≤44	85	12.74	19 (22.35)	66	<0.001	0.352 [0.206;0.601]
45-50	197	29.54	74 (37.56)	123	0.122	0.764 [0.543;1.075]
50-52	235	35.23	102 (43.40)	133	0.623	1.084 [0.786;1.495]
53-55	107	16.04	60 (56.07)	47	0.001	1.958 [1.290;2.974]
≥56	43	6.45	26 (60.47)	17	0.012	2.213 [1.177;4.163]
Parity	2386/3*					
yes	2058	86.25	575 (27.94)	1483	<0.001	1.925 [1.418;2.612]
no	328	13.75	55 (16.77)	273		
Parity/ number	2058				<0.001	
1	321	15.60	62 (19.31)	259	0.002	0.631 [0.470;0.846]
2	363	17.64	91 (25.07)	272	0.531	0.921 [0.712;1.191]
3	346	16.81	79 (22.83)	267	0.103	0.800 [0.611;1.047]
4	281	13.65	68 (24.20)	213	0.372	0.877 [0.656;1.171]
5	242	11.76	83 (34.30)	159	0.003	1.524 [1.149;2.022]
6	173	8.41	60 (34.68)	113	0.010	1.531 [1.103;2.123]
7	108	5.25	39 (36.11)	69	0.019	1.613 [1.078;2.416]
≥8	224	10.88	93 (41.52)	131	<0.001	2.148 [1.619;2.851]
Live-births	2058					
yes	1978	96.11	561 (28.36)	1417	0.034	0.536 [0.299;0.962]
no	80	3.89	14 (17.50)	66		
Live-births/ number	1978					
1	682	34.48	197 (28.89)	485	0.708	1.040 [0.847;1.277]
2	907	45.85	275 (30.32)	632	0,075	1.194 [0.982;1.453]
3	333	16.84	75 (22.52)	258	0.009	0.693 [0.525;0.916]
≥4	56	2.83	14 (25.00)	42	0.571	0.838 [0.454;1.547]
abortions	2051/7*					
yes	1397	68.11	448 (32.07)	949	<0.001	1.978 [1.580;2.476]
no	654	31.89	126 (19.27)	528		
abortions/ number	1397				<0.001	
1	434	31.07	111 (25.58)	323	0.001	0.638 [0.496;0.822]
2	361	25.84	102 (28.25)	259	0.071	0.785 [0.604;1.022]
3	225	16.11	79 (35.11)	146	0.286	1.178 [0.872;1.590]
4	126	9.02	46 (36.51)	80	0.263	1.243 [0.849;1.820]
>5	251	17.97	110 (43.82)	141	<0.001	1.865 [1.410;2.467]
Missed abortion	2049/10*					
yes	60	2.93	16 (26.67)	44	0.814	0.933 [0.522;1.666]
no	1989	97.07	558 (28.05)	1431		

** - number of missing data*

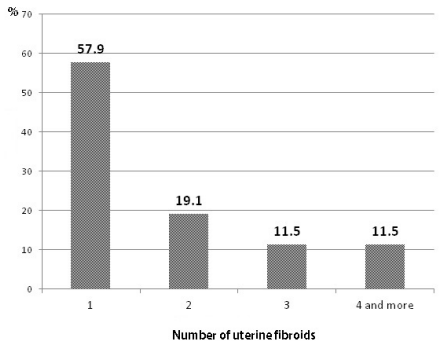

Fig. 1. *Number of UFs per patient (n = 631).*

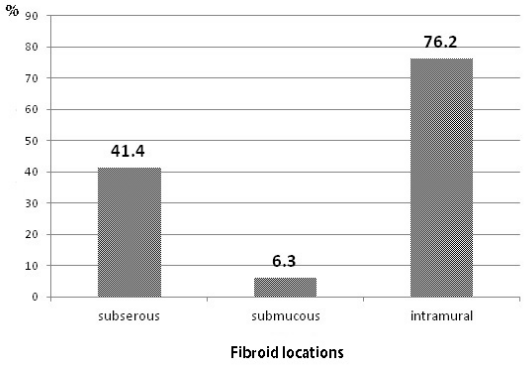

Fig. 2. *Fibroid locations in all age groups (n = 782).*

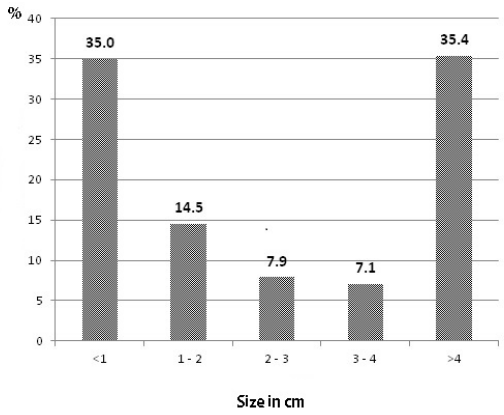

Fig. 3. *Size of UFs in all age groups (n = 631).*

With increasing age, the prevalence of uterine myomas rose from 1.24% (18–25 years) to 45.93% (51–55 years). The prevalence of fibroids at the age of 56–60 years was comparable to those at the age of 46–50 years and remained high in the older age groups of 61–65 years and over. The risk estimates were as follows: the age of ≤40 years was associated with a significant decrease in UF risk, whereas the age ≥41 years – with an increased risk (Table 1).

By the age of 36–40 years, the number of multiple nodules increased statistically significantly and then remained stable, while the proportion of women with single UF tended to decrease by 41–45 years (Fig.4).

When analyzing the impact of BMI on the UF prevalence, we found that OR for UF was lower in slim women and higher in women with BMI≥25 kg/m^2.

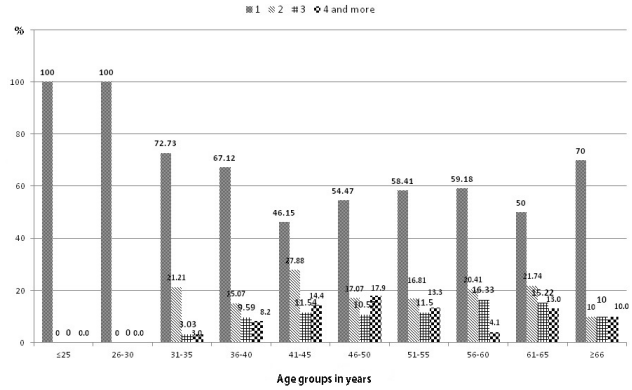

Fig. 4. *Number of UFs in study age groups.*

The relationship between age at menarche and the UF prevalence has been discussed by different authors.[13] In our study, the mean onset of menarche was between 9 years and 20 years (13.3±1.4 years). In most cases, no associations were found between the age at the first menstrual cycle and the age of fibroid diagnosis. In almost all age groups, except the group with the age of menarche equal to 15 years, the frequency of fibroids was similar, and ranged from 24.96% to 29.20% for age at menarche of 14 and 13 years, respectively. However, for the menarche age of 15 years, the incidence of fibroids is significantly lower (18.27%).

Menopausal women have a 2 times higher prevalence of fibroids than women of reproductive age, and the presence of menopause is a significant risk factor for fibroids (OR=2.8 [2.3;3.4]). The risk for UF rose significantly in women with the age of menopause at ≥53 years, whereas early menopause (≤44 years) was shown as a protective factor. However, both of these effects may be influenced by age as a possible impact factor concerning UF prevalence.

In our study, over 86% had at least one pregnancy. The prevalence of fibroids among this category of study participants was 27.94%. If there were more than 4 pregnancies, the prevalence of fibroids tended to increase from 34.30% to 41.52%. In our study, we found that among women with a history of abortions, the frequency of fibroids was significantly higher, as compared to that in women without a history of abortions (32% vs. 19.27%).

In conclusion, we demonstrated 26.41% UF prevalence in the unselected female population from Eastern Siberia. We found that the single nodules predominate among all fibroids, with the types 3–5 and the size of either ≤1 cm or ≥4 cm as the most frequent variants. Our study confirmed that the prevalence of fibroids increases with age. The incidence of fibroids is significantly lower in women with the age at menarche of 15 years. We also have found that a BMI of more than 25 kg/m^2, more than 4 pregnancies, and late menopause are risk factors for the development of fibroids.

Acknowledgments

This article contains material that has been discussed at the VIII International Research and Practical Conference «FUNDAMENTAL AND APPLIED ASPECTS OF

REPRODUCTION» (December 2021, Irkutsk, Russia). The author thanks all researchers who participated in the oral discussion.

Competing Interests

The authors declare that they have no competing interests.

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