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Effect of Body Mass Index Among Women with Uterine Leiomyoma: A Prospective Study



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ABSTRACT

Introduction: Uterine fibroids are the most prevalent disease in reproductive-age women in which slow-growing benign tumors arise from the myometrium of the uterus, affecting 40-45% of women at late reproductive age. The present study was a prospective observational study in which the effect of BMI among women with uterine fibroid is studied in Palakkad, Kerala. **Methods:** A prospective observational study was conducted at the Department of Gynecology and Obstetrics in a multi-specialty hospital in Palakkad for 6 months. Women of age >15 years who had uterine fibroid were included in the study. Data were collected regarding the patient's demographic details, detailed family history, reproductive history, signs and symptoms, laboratory investigations, and treatment charts. The effect of body mass index among women with uterine fibroid was analyzed with one sample student t-test. **Results:** A total of 161 patients were diagnosed with uterine fibroid in 6 months. The uterine fibroid was found to be more prevalent among married women of reproductive age (74.5%). The uterine fibroid was more prevalent among the age group 40-49 years (46.3%) which was followed by 50-59 years (26.8%), 30-39 years (19.5%), 60-69 years (4.9%), and 20-29 years (2.4%). The majority of the patients with uterine leiomyoma had a body mass index >25. The effect of body mass index among patients with uterine leiomyoma was found to be statistically significant. Various risk factors found in patients with uterine leiomyoma were elevated body mass index, history of previous dilation & curettage, and tubal sterilization, age at menarche ≤ 13, parity ≤ 1, cesarean delivery, elevated blood pressure, and genetics. Most of the patients were presented with menstrual abnormalities (72.7%). 49.1% of the patients were prescribed hormonal therapy and the most common surgical procedure was hysterectomy which was done on 36 patients (22.4%). **Conclusion:** Uterine fibroids are a common concern in women of reproductive age causing menstrual abnormalities, pain, and bladder disorders. The fibroid showed a directly proportional association with body mass index. The greater the body mass index, the more was the risk of developing fibroids.

INTRODUCTION

Uterine fibroids (leiomyoma, fibroleiomyoma) are slow-growing, benign tumors that develop from smooth muscle cells of the uterus.^[1] Uterine fibroids are the most frequent pelvic tumors in women.^[2] Worldwide, the fibroid uterus affects around 20-30% of women of reproductive age.^[3] Despite its high prevalence, the etiology, prevalence, natural history, and risk factors remain unclear. Exercise, dietary habits, stress, smoking, and consumption of caffeine can all enhance the risk of developing fibroids. In fibroid epidemiology, menstrual history, exogenous and endogenous hormone levels, and reproductive history also play a significant role. Fibroids are classified as subserous fibroids, intramural fibroids, and submucous fibroids, depending on their location in the uterus.^[3] Approximately 25% of women with uterine fibroid experience symptoms warranting medical intervention, such as menorrhagia, dysmenorrhoea, abdominal swelling, bladder disorders, dyspareunia, and lower back pain.^{[4][5]} Treatment choices for women with uterine fibroid include pharmacological therapies, invasive surgical, and minimally invasive (non-surgical) procedures.^[6]

BMI is a person's weight in kilograms divided by the square of height in meters. A high BMI is a measure of absolute body fat. Elevated BMI is important to risk factors for many diseases including uterine leiomyoma through changes in steroid hormone metabolism and bioavailability. Fibroids are found to be 2-3 times more prevalent in obese women, especially the ones with central obesity and in those with BMI >25. So, the study aims to find out the prevalence, risk factors, and management of uterine fibroid as well as the effect of BMI among women with uterine leiomyoma in a multi-specialty hospital at Palakkad.

MATERIALS AND METHODS

This was a hospital-based prospective observational study conducted in Paalana Institute of Medical Sciences, Palakkad. A study was conducted for 6 months. The study was approved by the Institutional ethics committee. Daniels' sample size formula was used to compute the sample size. Women of age >15 years who had uterine fibroid were included in the study. The exclusion criteria were women with ovarian, cervical, or uterine malignancy and patients who were not willing to give consent for the study. Signed informed consent was taken from the patient before the study. A pre-designed data collection form was used to collect the required information. Demographic details, detailed family history, reproductive history, signs and symptoms, laboratory investigations, and treatment charts were obtained from the

patient's file. The patients were categorized into married women of reproductive age, unmarried women of reproductive age, pregnant women, and menopausal women. The prevalence of uterine fibroids was studied in each category. The distribution of various socio-demographic characteristics, risk factors, clinical symptoms, and management of uterine leiomyoma were studied. The variables were presented as percentage and frequency and mean \pm standard deviation was calculated for quantitative variables. One sample student t-test was used to analyze the statistical significance of the effect of BMI among patients with uterine leiomyoma. The statistical test was performed using SPSS software. P-value <0.05 was used to assign statistical significance.

RESULTS AND DISCUSSION

A total of 161 patients were diagnosed with uterine fibroid in 6 months. The uterine fibroid was found to be more prevalent among married women of reproductive age (74.5%), followed by menopausal women (11.2%), pregnant women (10.6%). The uterine fibroid was least prevalent among unmarried women of reproductive age (Figure 1). A similar result was observed in a study conducted by J. Luthra et al. in 2020, in which most of the patients who had uterine fibroids are married (87.5%).

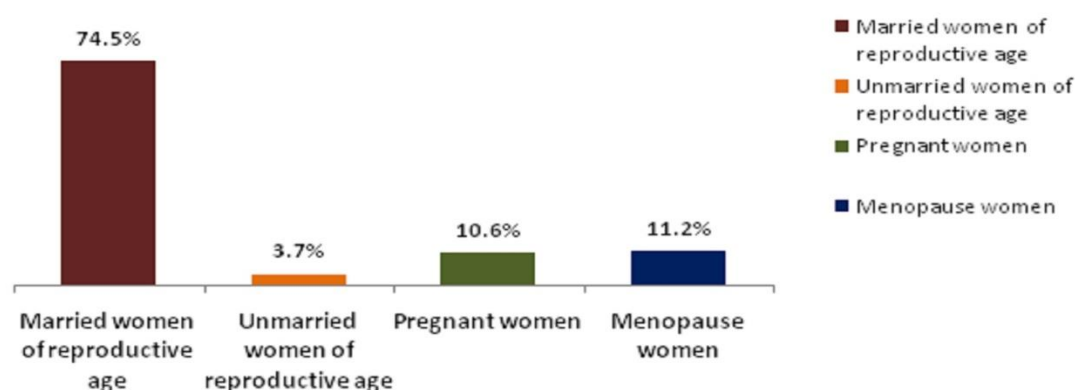


Figure no 1: Prevalence of uterine fibroid among various categories of women

The uterine fibroid was more prevalent among the age group 40-49 years (46.3%) which was followed by 50-59 years (26.8%), 30-39 years (19.5%), 60-69 years (4.9%), and 20-29 years (2.4%). Khyade and Srilatha et al. found a similar finding, with uterine fibroids being more frequent in the 40-59 and 40-45 age groups, respectively. ^[9, 10] This can be explained by the increased level of female sex hormones during reproductive age. The majority of the patients have parity of 2 (37.9%). Out of 161 patients, 27 had a family history of uterine leiomyoma.

90.1 % of the patients were non-vegetarian and consumed red meat regularly. The socio-demographic characteristics of patients with uterine leiomyoma are depicted in Table 1.

Table no 1: Demographic characteristics of patients with uterine leiomyoma

Characteristics	Number of patients	Percentage (%)
Age groups (in years)		
20-29	12	7.5
30-39	32	19.8
40-49	76	47.8
50-59	36	22.4
60-69	5	2.5
Parity		
0	39	24.2
1	35	21.7
2	61	37.9
>3	26	16.1
Family history		
Yes	21	13
No	140	87
Dietary pattern		
Vegetarian	16	9.9
Non -vegetarian	145	90.1

The effect of body mass index among women with uterine leiomyoma is shown in Table 2. The majority of the patients with uterine leiomyoma had BMI >25. The effect of BMI among patients with uterine leiomyoma was found to be statistically significant.

Table 2: Effect of BMI among patients with uterine leiomyoma

BMI (Kg/m ²)	Number of patients	Percentage (%)	P-value
<18.5 (Underweight)	5	3.1	<0.001
18.5-24.9 (Normal)	51	36	
25-29.5 (Overweight)	76	42.9	
>29.5 (Obesity)	29	18	

Various risk factors found in patients with uterine leiomyoma were elevated BMI(65.3%), history of previous D &C(52.2%), history of tubal sterilization(36%), age at menarche \leq 13(42.2%), parity \leq 1(46%), caesarean delivery(23%), elevated BP(19.9%) and genetics(13%). A similar study conducted by Anjali et al concluded that parity of \leq 2, and family history were significant risk factors for uterine fibroid^[11, 14]. Table 3 lists the various risk factors.

Table no 3: Risk factors of uterine leiomyoma

Risk factors	Number of patients	Percentage (%)
Elevated BMI	105	65.3
Parity \leq 1	74	46
Genetics	21	13
Age at menarche \leq 13	68	42.2
History of tubal sterilization	58	36
History of hormone therapy	42	26.1
History of D &C	84	52.2
Caesarean delivery	37	23
Elevated BP	32	19.9

Most of the patients present with menstrual abnormalities(72.7%) such as menorrhagia, metro-menorrhagia, passing blood clots, and dysmenorrhoea. Abdominal swelling(25.5%),abdominal pain(16.1%), bladder disorders(21.7%), backache(13%), dyspareunia(7.5%), infertility(4.3%) were the common symptoms other than menstrual irregularities. Very few patients were asymptomatic(8.7%)(**Figure 2**). A study by Samanta et al.and Swain et al.also shows a similar outcome in which most of the patients with uterine leiomyoma were experiencing menorrhagia, dysmenorrhoea, and abdominal pain.^[6]

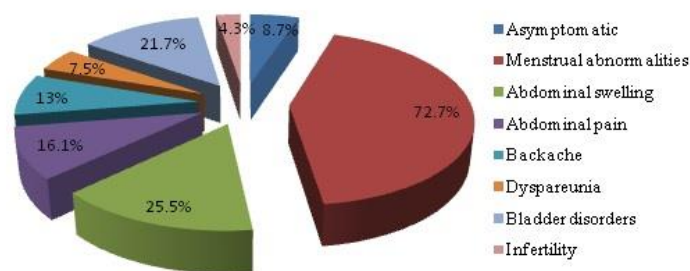


Figure no 2: Distribution of symptoms among patients with uterine leiomyoma

The number and location of myomas vary from patient to patient, which accounts for the symptom severity. Most of the patients had one myoma (53.4%) and three fibroids were found in the least patients. The most common type was a subserous fibroid (70.2%), while the least type was a submucosal fibroid (8.7%). The findings were consistent with many other similar studies^[6, 10, 12] Table 5 depicts the distribution of various types of fibroid.

Table no 4: Distribution of fibroid characteristics

Characteristic	Number of patients	Percentage (%)
Number of fibroids		
1	86	53.4
2	42	26.1
3	15	9.3
>3	18	11.2
Type of fibroid		
Intramural fibroid	69	42.9
Subserous fibroid	113	70.2
Submucosal fibroid	14	8.7

Based on location, size, and severity of fibroids, treatment options for uterine leiomyoma are pharmacological management or surgical management. 49.1% of the patients were prescribed hormonal therapy to control the growth of the tumor and 19.9 % of the patients were prescribed symptomatic therapy alone to relieve severe symptoms such as menstrual bleeding, dysmenorrhoea, and other co-morbidities. The most common surgical procedure was hysterectomy which was done on 36 patients (22.4%) and myomectomy was performed on the least number of patients who wish to preserve their uterus. (Table 5)

Table no 5: Management of uterine leiomyoma

Management	Number of patients	Percentage (%)
Lifestyle modifications	11	6.8
Hormone therapy	79	49.1
Symptomatic treatment	32	19.9
Hysterectomy	39	22.4
Myomectomy	3	1.9

CONCLUSION

According to our results, uterine leiomyoma is more frequently seen in patients of age group 40-49 years. The uterine fibroid was more common among married women of reproductive age. More than half of the patients with uterine leiomyoma are overweight or obese. A statistically significant relationship is found between increasing BMI and uterine fibroid. The risk of developing uterine fibroid increases with elevated BMI. The other risk factors are the history of D &C, tubal sterilization, cesarean delivery, elevated BP, age at menarche ≤ 13 , and Parity ≤ 1 .

CONFLICT OF INTEREST

The authors have no conflicts of interest regarding this investigation.

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