



Research article

**Prevalence, risk factors and clinical profile of thyroid abnormalities: a prospective study among women with uterine leiomyoma**

Keerthana. N \*, C.I Sajeeth, Mable John

Grace College of Pharmacy, Palakkad, Kerala

**ABSTRACT**

Uterine leiomyoma and thyroid functions are crucially affected by estrogen among reproductive-age women. Even so, the association between the two diseases has rarely been studied. Therefore, this study aims to assess the prevalence of thyroid abnormality in women with uterine leiomyoma in Palakkad, Kerala. A case-control study was conducted for 6 months, including women of age >15 years who had uterine leiomyoma. The prevalence of thyroid abnormalities and distribution of various socio-demographic characteristics, risk factors and clinical profile of patients with uterine leiomyoma were studied. Thyroid abnormalities were seen in 41 of the 110 women with uterine leiomyoma (37%) and were most commonly detected in married women of reproductive age (73.2%). Elevated body mass index, prior abortion, tubal sterilization, age at menarche  $\leq$  13, parity  $\leq$  1, caesarean delivery, elevated blood pressure and genetics were all risk factors for uterine leiomyoma. However, none of these factors, except for history of previous abortion ( $p \leq 0.05$ ) showed a significant difference in risk factors among the study groups. Most of the patients were presented with menstrual abnormalities (78%). Among the various symptoms found, abdominal swelling and pelvic pain were observed to be statistically significant among patients with thyroid abnormalities. Uterine leiomyoma is a common concern in women of reproductive age, causing menstrual abnormalities, pain and bladder disorders. Among the various co-morbidities, thyroid abnormalities are more common among women with uterine leiomyoma. However, there is no significant difference between the two groups regarding risk factors and symptoms.

**Keywords:** Uterine leiomyoma, Fibroid, Thyroid abnormalities, Risk factors, Clinical profile.

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**Correspondence:** Keerthana N\* ✉ [keerthana.pkd97@gmail.com](mailto:keerthana.pkd97@gmail.com)

Department of Pharmacy Practice, Grace College of Pharmacy, Athalur, Kodunthirapully, Palakkad, Kerala, India.

**INTRODUCTION**

Uterine fibroids are the most prevalent disease affecting reproductive-age women, in which slow-growing benign tumours arise from the myometrium of the uterus, affecting 40-45% of women of late reproductive age<sup>[1,2]</sup>. Uterine fibroids are a leading cause of morbidity in women of reproductive age and after menopause. In spite of extensive studies, the etiology and pathophysiology of fibroids are still under investigation<sup>[3,4]</sup>. It is widely believed that the development of leiomyoma depends on continuous oestrogen stimulation<sup>[5]</sup>. Most women with uterine fibroids do not seek medical attention due to their asymptomatic nature.<sup>[6]</sup> Fibroids are most commonly manifested by their impact on a woman's menstrual cycle or by complaints of pelvic discomfort<sup>[7]</sup>. Aside from the location, the size, weight of the fibroid and the volume of the fibroid also affects a person's chances of experiencing various symptoms. Myomas can be found in three different locations: intramural, sub-serosal, and sub-mucosal<sup>[8]</sup>. The treatment of uterine fibroids is influenced by numerous factors, including symptomatology, the location and size of

the fibroids, the patient's age and reproductive requirements, and the therapist's skills<sup>[6]</sup>. Pharmacological therapies, invasive surgical and minimally invasive (non-surgical) procedures are the treatment options for women with uterine leiomyoma. Progesterone analogues, combined oral contraceptives, aromatase inhibitors, gonadotropin-releasing hormone (GnRH) agonists, and selective estrogen receptor modulators are the pharmacological treatments extensively used to reduce or control tumour growth and relieve symptoms like dysmenorrhoea and menorrhagia. Hysterectomy, myomectomy and endometrial ablation are surgical procedures<sup>[9]</sup>. Previous researches have showed that estrogen regulate thyroid-stimulating hormone (TSH) production and influence thyroid function and regulate of thyroid-stimulating hormone (TSH) production; Furthermore, oestrogen receptors are present in both normal and neoplastic thyroid tissue<sup>[6]</sup>. As a result, it has been hypothesized that the presence of uterine fibroids could be associated with the development of thyroid disorders. However, further research is needed to analyse the

relationship between these conditions <sup>[10]</sup>. Moreover, there has been no study about these associations in Indian populations. The objective of this case-control study was to determine the relationship between the thyroid function and the uterus fibroids in women from Palakkad, Kerala.

## MATERIALS AND METHODS

A case-control study was conducted for 6 months at the Department of Gynaecology and Obstetrics in a multi-speciality hospital in Palakkad, Kerala. The Institutional ethics committee approved the study. 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 prior to the study. A pre-designed data collection form was used to collect the required information. Data was collected regarding patient's demographic details, detailed family history, reproductive history, signs and symptoms, laboratory investigations and treatment charts. The prevalence of thyroid abnormalities was studied in patients with uterine leiomyoma. The distribution of various socio-demographic characteristics, risk factors, thyroid abnormalities and clinical profile of patients with uterine leiomyoma were studied.

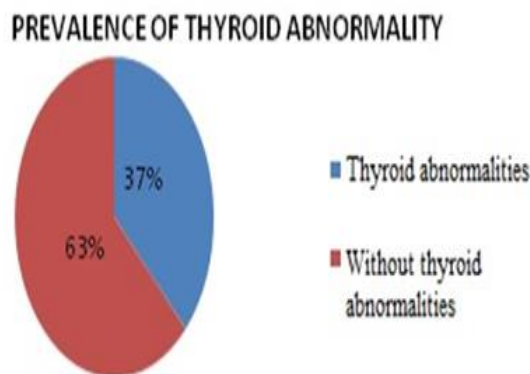
### Statistical analysis

The collected cases were entered into MS Excel 2007 to calculate the percentage of various parameters. Descriptive statistics like frequency and percentage were used to describe the demographic characteristics and determinants of the uterine fibroid. Inferential statistics such as the Chi-square test and odds ratio were used and  $p < 0.05$  was considered as statistically significant. Statistical analysis was performed using SPSS software.

## RESULTS AND DISCUSSION

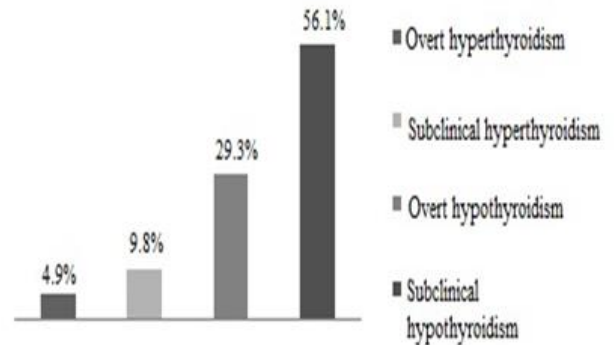
110 patients were diagnosed with uterine fibroid in 6 months. Out of the 110 patients, 41 patients (37%) had thyroid abnormalities. (Figure 1).

**Figure 1:** Prevalence of thyroid abnormalities in patients with uterine leiomyoma



The majority of women with uterine fibroid had hypothyroidism, with subclinical hypothyroidism (56.1%) being more frequent than overt hypothyroidism (29.3%), and hyperthyroidism detected in 14.6% of patients (Figure 2). The influence of oestrogen on thyroid function and the regulation of TSH might explain the thyroid abnormalities associated with uterine fibroid.

**Figure 2:** Distribution of thyroid abnormalities in patients with uterine leiomyoma



Uterine fibroid was more prevalent among 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.<sup>[10][11]</sup> This can be explained by the increased level of female sex hormones during reproductive age.

Married women of reproductive age were predominantly diagnosed with uterine fibroid with 73.2% followed by 17.1% pregnant women and the least in menopausal women and unmarried women of reproductive age with 4.9%. Majority of the patients were non-graduates (58.5%). 85.4% of the patients were non-vegetarians with increased consumption of red meat. (Table 1).

**Table 1:** Demographic characteristics of patients with uterine leiomyoma

Characteristics	Number (%)	
	Patients with thyroid abnormalities	Patients without thyroid abnormalities
Age	20-29	1 (2.4)
	30-39	8 (19.5)
	40-49	19 (46.3)
	50-59	11 (26.8)
	60-69	2 (4.9)
Category	Unmarried women of reproductive age	2 (4.9)
	Married women of reproductive age	30 (73.2)
	Pregnant women	7 (17.1)
	Menopausal women	2 (4.9)
Education	Graduates	17 (41.5)
	Non-graduates	24 (58.5)
Dietary habits	Vegetarian	6 (14.6)
	Non-vegetarian	35 (85.4)

Various risk factors found in patients with thyroid abnormalities who had uterine leiomyoma were elevated BMI (58.5%), history of previous abortion (56.1%), history of tubal sterilization (48.8%), age at menarche  $\leq 13$  (43.9%), parity  $\leq 1$  (36.6%), caesarean delivery (26.8%), elevated BP (24.4%) and genetics (17.1%). However, there were no statistical difference in risk factors, except for history of previous abortion ( $p \leq 0.05$ ), between women with uterine leiomyoma who had thyroid problems and those who did not. A similar study conducted by Anjali et al. concluded that parity of  $\leq 2$ , and family history were significant risk factors for uterine fibroid [12]. Table 2 lists the various risk factors.

**Table 2:** Risk factors of uterine leiomyoma

Risk factors	Number (%)		OR	p-value
	Patients with thyroid abnormalities	Patients without thyroid abnormalities		
Elevated BMI	24 (58.5)	41 (59.4)	0.96	0.92
Parity $\leq 1$	15 (36.6)	29 (42)	0.79	0.57
Genetics	7 (17.1)	10 (14.5)	1.01	0.98
Age at menarche $\leq 13$	18 (43.9)	40 (57.9)	0.56	0.15
History of tubal sterilization	20 (48.8)	25 (36.2)	1.67	0.19
History of previous abortion	23 (56.1)	25 (36.2)	2.24	0.04
Caesarean delivery	11 (26.8)	18 (26.1)	1.03	0.93
Elevated BP	10 (24.4)	20 (29)	0.79	0.6

The number and location of myomas vary from patient to patient, which accounts for the symptom severity. The most common type was intramural fibroid (75.6%), while the least type was submucosal fibroid (14.6%). The findings were consistent with many other similar studies [6-11-13]. We found a statistically significant difference among type of fibroid present in patients with thyroid abnormalities ( $p \leq 0.05$ ). Table 3 depicts the distribution of various types of fibroid.

**Table 3:** Distribution on type of fibroid

Type of fibroid	Patients with thyroid abnormalities	Patient without thyroid abnormalities	p-value
Intramural fibroid	31	25	0.01
Subserous fibroid	20	49	
Submucosal fibroid	6	8	

Most of the patients present with menstrual abnormalities (78%) such as menorrhagia, metro menorrhagia, passing blood clots and dysmenorrhoea, abdominal swelling (46%), pelvic pain (27%), bladder disorders (22%), backache (12%), dyspareunia (5%), infertility (7%) were the common symptoms other than menstrual irregularities. Very few patients were asymptomatic (7%) (Table 4). Among the various symptoms found, abdominal swelling and pelvic pain were found to be statistically significant among patients with thyroid abnormalities. 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 [14].

**Table 4:** Distribution of symptoms among patients with uterine leiomyoma

Symptoms	Patients with thyroid abnormalities	Patient without thyroid abnormalities	p-value
Asymptomatic	3	7	0.61
Menstrual abnormalities	32	48	0.33
Abdominal swelling	19	15	0.01
Pelvic pain	11	7	0.02
Backache	5	10	0.73
Bladder disorder	9	20	0.41
Dyspareunia	2	9	0.16
Infertility	3	15	0.99

## CONCLUSION

According to our results, thyroid abnormalities are more prevalent among women with uterine leiomyoma. Uterine leiomyoma is more frequently seen in patients of age group 40-49 years. History of prior abortion was found to be having 2 times for developing fibroid in patients with thyroid abnormalities while other risk factors such as elevated BMI, history of previous abortion and tubal sterilization, parity of age at menarche  $\leq 13$  and Parity  $\leq 1$  are not statistically significant. Patients with thyroid abnormalities are more likely to develop intramural fibroid. We found distribution of symptoms to be statistically non-significant among study groups, except for the abdominal swelling and pelvic pain. Therefore, the study demonstrates that there was no statistically significant difference between women with uterine leiomyoma who had thyroid problems and those who did not.

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## CONFLICT OF INTEREST

The authors have no conflicts of interest regarding this investigation.

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