A study on Menarche age of women with Uterine Leiomyoma

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ABSTRACT

Uterine leiomyomas or fibroids are noncancerous growths of the uterus that often appear during childbearing years. According to Baird *et al.* (2003) uterine fibroids are the most common benign uterine tumours with an estimated incidence of 20%-40% in women during their reproductive years. The study was conducted among hundred subjects selected by purposive sampling techniques in the age group of 30-50 years from Thrissur district. A specially designed questionnaire was formulated to elicit the demographic details, medical history, menstural and obstetric data dietary pattern of the subject. The anthropometric data revealed that majority (31%) of the subjects belonged to the category of grade I and grade II obesity and 73% had a waist hip ratio above normal. The medical history reveals the presence of multiple medical problems such as HTN, DM being the most common among the subjects. 70% of the subjects suffered from several associated menstrual problems. The age at menarche of the subjects were collected and analysed to know its association to the incidence of fibroids. The data is summarised in the figure below. The data shows that, 20% of the subjects had their menarche at 12 years, 41% had on 13 years, 25% had on 14 years and 14 % had on 15 years. According to Dragomir *et al.* (2010) studies have identified early age at menarche as a risk factor for the development of uterine leiomyoma or fibroids. The study reveals that 20% of subjects attained majority menarche at the age of 12 years and 31% at 13 years and in agreement with the prior studies could be considered as a risk factor for developing fibroids.

Key Words : Leiomyoma, Menarche

INTRODUCTION

Uterine fibroids are the most common benign uterine tumors with an estimated incidence of 20%-40% in women during their reproductive years. Fibroids are known to increase with age throughout the reproductive years and it is well established that there is a higher prevalence among black women (Baird *et al.,* 2007). Fibroids most commonly cause symptoms in women between age 30 and 50 years (Institute for Quality and Efficiency in Health Care (IQWiG, Germany), 2014) and are abnormal growths typically benign (non cancerous) that develop in or on a women's uterus (Emanuel, 2015). Fibroids may grow as a single tumour or in clusters and can cause excessive menstrual bleeding, pelvic pain, and frequent urination (Melissa and Charles, 2007). They may grow large enough to obstruct the uterus, compress the great vessels, or compromise of pulmonary ventilation (Neuwrith and Moritz, 2008).

Uterine fibroids are associated with an increased rate of spontaneous miscarriage, preterm labour, placenta abruption, malpresentation, labour dystocia, caesarean delivery and post partum haemorrhage (Errol *et al.,* 2010). Pregnant women with fibroids are significantly more likely to develop preterm labour and to deliver preterm than women without fibroids (Klatsky *et al.,* 2008). A number of foetal anomalies have been reported in women with large submucosal fibroids, including dolichocephaly (lateral compression of the foetal skull), torticollis (abnormal twisting of the neck) and limb reduction defects (Chuang *et al.,* 2001). Fibroids are also known to influence the contractility of the myometrium and induce a chronic inflammatory reaction, both of which may hinder implantation (Richards and Tiltman, 1998). Leiomyomas may also cause dysfunctional uterine contractility and interfere with sperm and ovum transport (Vollenhoven *et al.,* 1990).

The age at menarche ≤11 years is associated with an increased risk of fibroids when compared with mean age at menarche (12-13years) and that age at menarche >13years is associated with reduced risk. Furthermore, individuals with earliest age at menarche (≤11years) were most at risk of developing multiple fibroids compared with those with a mean age at menarche of 12-13 years (Donna *et al.,* 2013). Family history of uterine fibroids also seems to be a major risk factor, early menarche and the use of oral contraceptives before 16 years of age are associated with an increased risk, whereas the use of progestin-only injectable contraceptives is associated with a reduced risk. Association between early age at menarche and fibroid presence was apparent and low vitamin D status could increase susceptibility to fibroids. The active metabolite of vitamin D has been shown to inhibit cell proliferation and extracellular matrix production in fibroid tissue culture and to reduce volume. Dietary factors, including increased consumption of fruit, vegetables and low-fat dairy products are associated with reduced risk. High body mass index is a risk factor (Donna *et al.,* 2013).

Estrogen and progestone are recognized as promoters of tumour growth. Growth factors with mitogenic activity, such as transforming growth factors basic fibroblast growth factor, epidermal growth factors and insulin like growth factor-1, are elevated in fibroids and maybe the effectors of oestrogen and progesterone promotion (Andersen and Barbieri, 2003).

Objectives :
  – To study the age at menarche of the selected subjects with uterine leiomyoma
  – To assess the health status and dietary pattern of the selected subjects.
  – To study the various menstrual problems associated with uterine leiomyoma

METHODOLOGY

Hundred subjects with leiomyoma aged between 30 to 50 years were selected by purposive sampling from few selected hospitals in Thrissur district by examination of their medical records. A specially designed questionnaire was formulated to elicit the demographic details, medical history, menstrual and obstetric data and dietary pattern of the subjects. Anthropometric measurements like height, weight and waist circumference were recorded. Dietary assessment was done by calculation of food frequency score. Food consumption pattern of the subjects were studied with respect to their food habits and frequency of use of food items. The results of the study were statistically analyzed by calculating mean values of the menarche age and mean dietary intakes were calculated to assess the percentage of RDA met.

RESULTS AND DISCUSSION

Demographic and lifestyle details :

The socio economic status (SES) is an important determinant of health, nutritional status, mortality and morbidity of individual (Agarwal *et al.,* 2005). Majority (86%) of the subjects belonged to the urban locality. 37% of the subjects were between 45-50 yrs of age, 31% between 40-45yrs, 17% between 30-35yrs and 15% between 35-40years. 94% of the subjects were married and 3% were unmarried. The occupational status of subjects shows that majority (75%) were homemakers and 86% of the subjects were the members of nuclear family. The results of the study showed that seventy three per cent of the subjects had no time to spare for exercise and majority considered house hold chores as a physical activity.

Anthropometric data :

Obesity is associated with the development of fibroids most likely through increasing endogenous hormone levels, decreasing serum hormone-binding globulin, altering estrogen metabolism under premenopausal conditions, and changing myometrial cell signalling controlling such as insulin receptors, insulin like growth factors and peroxisome proliferator – activated receptors (Clarke *et al.*, 2009). The study results showed that 29% of subjects had BMI in the range of 18 to 24.9 (normal), 31% subjects represent the range of 25 to 29.9 (grade I obesity), 33% were in range of 30 to 24.9 (grade II obesity) and 7% were range above 35 (grade III obesity). And 73% had a waist hip ratio above normal.

Menstrual and obstetric details :

Uterine fibroid tumours or leiomyomas very often lead to abnormal menstrual bleeding or menorrhagia (Koehler and Rees, 2003. Increased parity is associated with a decreased risk, possibly through elimination of incipient fibroids as the uterus involutes post partum (Elizabeth and Stewart, 2015). Fibroids can cause distortion and enlargement of the endometrial cavity by submucous and intramural leiomyomas with an intra cavitary component affect implantation (Dawood, 1985). The menstrual details of the subjects regarding the age at onset of menstruation (menarche), details of

Table 1 : Menstrual and obstetric details of the subjects				
Sr. No.	Criteria	Categories	Frequency	Percentage
1.	Regularity of mensturation	Yes	92	92
		No	8	8
2.	Intensity of menstural flow	Normal	84	84
		Heavy	16	16
3.	Duration of menstrual cycle	3-5	54	54
		6-8	43	43
		>8	3	3
5.	Age at pregnancy	19-24yrs	78	78
		25-30yrs	22	22
6.	Number of miscarriages	1	4	4
		2 or more	2	2
7.	Parity	Null parity	2	2
		Mono parity	7	7
		Multi parity	91	91

the menstrual cycle like regularity and duration and associated menstrual problems were collected. The obstetric history comprises details like age at first pregnancy, number of miscarriages if any and problems experienced during pregnancy etc. There was difficulty in conceiving observed in 14 per cent and 6 per cent experienced miscarriage.

Menstrual problems :

Women with uterine fibroids typically have spasmodic dysmenorrhoeal, with the uterus going into spasms as it tries to expel the large clots and excess blood (Fernandez *et al.,* 2001). Fibroids usually cause symptoms if they affect the function of the womb, for example during menstrual bleeding. Heavy menstrual bleeding, increase urge to urinate constipation pain etc. are symptoms.

Fig. 1 : Menstrual problems of the subjects
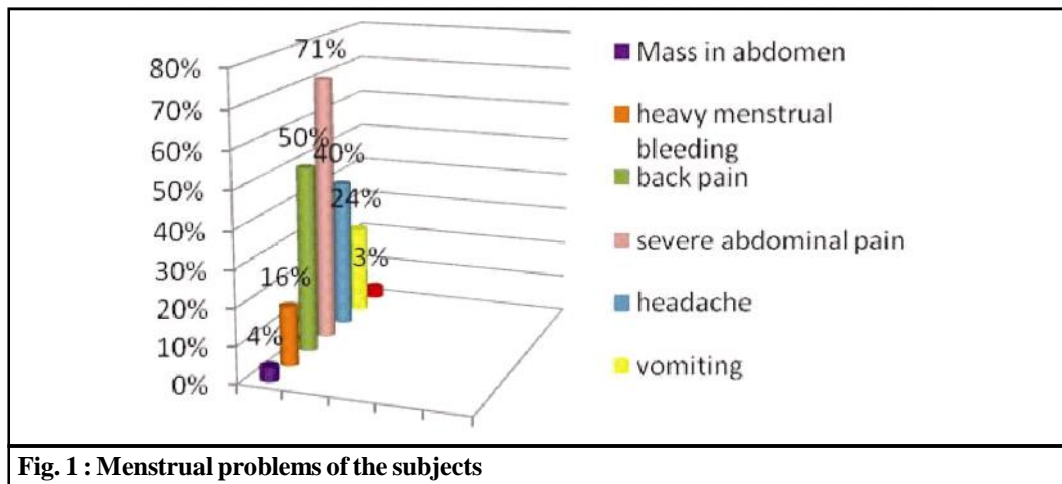
Age at menarche :

Studies have identified early age at menarche as a risk factor for the development of uterine leiomyoma or fibroids (Dradomir *et al.,* 2010). Fibroids have been found to increase number of estrogen receptors, reduced capacity of metabolizing estradiol to the less active estrone and enhanced transcriptional response to estrogen exposure compared with myometrium. The age at menarche
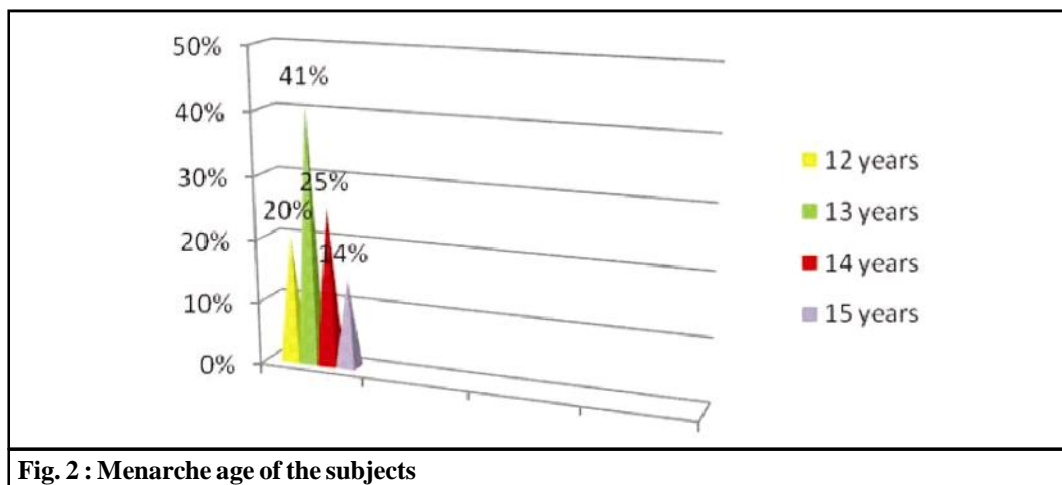
Fig. 2 : Menarche age of the subjects

of the subjects were collected and analysed to know its association to the incidence of fibroids. The data is summarised in the figure below.

Medical history :

Uterine fibroids in first degree relatives double the risk. This fact is explained by increased expression of selected growth factors such as vascular endothelial factor (Okolo *et al.,* 2005). 36% subjects had the family history of uterine fibroids and 12% of subjects had taken treatment (undergone laproscopic procedures) for uterine fibroids. Diabetes (17%) and hypertension (16%) are the most frequent findings among the subjects with thyroid diseases reaching to 10 per cent and 24 per cent of the subjects were taking medications for diseases.

Dietary Pattern :

Dietary patterns analysis is an emerging area of research (Gren *et al.,* 2016). Dietary pattern of the subjects showed that about 90 per cent of the subjects were non vegetarians. It was found that 27 per cent of the samples consumed food from outside once or twice in a week and 21 per cent consumed on a weekly basis. Frequency of use of different food groups by the subjects was measured on a five point scale and lowest score was obtained for green leafy vegetables and pulses. The food and nutrient intakes of the subjects were determined by 24 hour recall method and the mean nutrient intake of the subjects were calculated and compared with RDA. They met all the other nutrients except calcium, vitamin C and folic acid.

Table 2 : Comparison of nutritive value with RDA				
Sr. No.	Nutrients	RDA	Mean value	Percentage of RDA met
1.	Calorie (kcal)	2230	1582.7279	70.9743
2.	Protein (gm)	55	48.56	88.2909
3.	Fat (gm)	25	21.5340	86.136
4.	Calcium (mg)	600	385.322	64.2203
5.	Iron (mg)	21	9.635	45.880
6.	Retinol (ugm)	600	162.554	27.0923
7.	carotene (IU)	4800	819.48	17.0625
8.	Vitamin c(mg)	40	36.142	90.355
9.	Folic acid(mg)	200	150.88	75.44

Summary and conclusion :

The anthropometric data revealed that 71 per cent were obese and 73 per cent had a waist hip ratio above normal. The study showed that 20 per cent of the subjects had their menarche at 12 years, 41 per cent of subjects had their menarche at 13 yrs, 25 per cent had at 14 yrs and 14 per cent had on 15 years. Majority of subjects experienced symptoms associated with fibroids like heavy menstruation, amenorrhoea, painful period, back pain and difficulty in conceiving and miscarriage. Details regarding the medical history of the subjects showed that 36 per cent were having family history of uterine fibroids and 47 per cent of subjects had taken treatment for uterine fibroids which includes laparoscopic surgery. The results of the comparison of the mean food and nutrient intakes of the subjects with RDA revealed that they had inadequate dietary intake with vitamin A values reaching minimum among the nutrients calculated. As per the statistical analysis of the data the mean age of menarche was found to be 13.33 years. Studies on the association

between early age at menarche and fibroids show that each additional year of hormonal cycles confers additional risk for developing a fibroid (Schwartz, 2001).

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