An overview on the multitude of factors promoting and symptoms associated with the incidence of uterine Leiomyoma among women of reproductive years

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Abstract

According to the study published by Baird et al., (2007) in American journal of epidemiology, uterine fibroids are the most common benign uterine tumours with an estimated incidence of 20%-40% in women during their reproductive years and are known to increase with age throughout the reproductive years. Fibroids most commonly cause symptoms in women between age 30 and 50 years and are abnormal growths in a women's uterus typically benign (IQWiG, 2014; Mark, 2015). Melissa, 2007 reported that fibroids may grow as a single tumor or in clusters and can cause excessive menstrual bleeding, pelvic pain, and frequent urination. Neuwrith and Moritz, 2008 opined that the fibroids may grow large enough to obstruct the uterus, compress the great vessels, or compromise of pulmonary ventilation.

Introduction

As per the findings of Errol et al., (2010) in the journal of Obstetrics and Gynecology fibroids are associated with an increased rate of spontaneous miscarriage, preterm labor, placenta abruption, malpresentation, labor dystocia, caesarean delivery and post partum hemorrhage. Pregnant women with fibroids are significantly more likely to develop preterm labour and to deliver preterm than women without fibroids reported in the American journal of gynecology by Klatsky et al., 2008. A study by Chuang et al., 2008 pointed out that a number of fetal anomalies have been reported in women with large sub mucosal fibroids, including dolichocephaly (lateral compression of the fetal skull), torticollis (abnormal twisting of the neck) and limb reduction defects. Vollenhoven, (1990) in British journal of Obstetrics and Gynecology referred that leiomyomas may also cause dysfunctional uterine contractility and interfere with sperm and ovum transport.

Donna et al., 2013 outlined that 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; and that family history also seems to be a major risk factor. According to the study '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. And dietary factors, including increased consumption of fruit, vegetables and low-fat dairy products are associated with reduced risk'.

Anderson and Barberi, (2003) in the Journal of social gynecological investigation commented on the role of estrogen and progesterone as promoters of tumor growth; and that 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 estrogen and progesterone promotion.   .

Materials and methods used

Hundred subjects with leiomyoma aged between 25 to 40 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 were recorded and body mass index and waist circumference were analyzed. 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.

Results and discussion

Socio economic details

According to Agarwal et al (2005) the socio economic status (SES) is an important determinant of health, nutritional status, mortality and morbidity of individual. SES also influences the accessibility, affordability, acceptability and actual utilization of available health facilities. Majority (58%) of the subjects were between 35-40 yrs of age. The occupational status showed that 75% was homemakers and 86%of the subjects were the members of nuclear family. The data regarding the annual income level of the subjects showed that 6 had below Rs10000.

Anthropometric data

Schwartz et al., (2000) described that BMI may influence the risk by changes in steroid hormone metabolism and availability. The results shows that 23% subjects represent the BMI range of 25 to 29.9 (grade I obesity), 6% were in range of 30 to 24.9 (grade II obesity) and 2%were range above 35(grade III obesity). Waist hip ratio gives distribution of fat in the body; from the total selected subjects 97% had a waist hip ratio greater than 0.7 (obese) and 3% had below 0.7(normal level).

Heredity

Okolo et al., 2005 commented that uterine fibroids in first degree relatives double the risk and is explained by increased expression of selected growth factors such as vascular endothelial factor. 36% subjects had the family history of uterine fibroids and 12% of subjects had taken treatment (undergone laproscopic procedures) for uterine fibroids. The medical history received from the subject shows diabetes (17%) and hypertension (16%) are the most frequent findings among

the subjects with thyroid diseases reaching to a 10%. 24% of the subjects are on medications for these disease whereas 16% had not . 5% of the subjects family had kidney disease, 37% had diabetes, 33% had hypertension and 3% had thyroid.

Age at menarche and fibroid incidence

Studies by Fernandez et al., (2001) reported that early age at menarche as a risk factor for development of uterine leiomyoma. Dradomir et al., (2010) observed in his prior studies that early age at menarche as a risk factor for the development of uterine leiomyomata or fibroids. The data shows that, 20% of the subjects had their menarche at 12 years, 41% had on 13 years, 25% had on 14 years and14 % had on 15 years. Baird et al*.,* (2010) reported that in two cross-sectional analyses from the National Institute of Environmental Health Sciences (NIEHS) Sister Study, researchers identified prenatal and early life factors that might influence fibroid development and these factors could also influence early age at menarche.

Life style

Donna et al., (2007) outlined that exercise is protective for breast cancer and that women in the highest category of physical activity were significantly less likely to have fibroids. The results showed that only 12 percent of the subjects were involved in regular physical activity with a frequency of thrice a week. A multistate Bayesian analysis indicated that exercise was associated with tumor onset more strongly than with tumor growth. When data for women who reported major fibroid-related symptoms were excluded, results remained essentially unchanged, suggesting that the observed association could not be attributed to reverse causation. The study concluded that regular exercise might help women prevent fibroids.

Parity

Stewart et al., (2014) signalized that higher parity is associated with a reduced risk (80% risk reduction when those with three or more deliveries compared with nulliparous women.) Also a two to three fold increase is mentioned among those who gave birth more than 5 years ago. 78% of the subjects had their first pregnancy between 19-24yrs and 2% of the subjects have null parity, 7% mono parity and 91% have multi parity. 6 % had a history of abortion.

Symptoms associated with leiomyoma

Menorrhagia

Oehler (2003) in Acta obstetricia et gynecologica scandanavica pointed out that uterine leiomyomas very often lead to abnormal menstrual bleeding or menorrhagia (menorrhagia is abnormal extensive menstrual bleeding in cases where the quantity of the overall blood loss exceeds 80 ml in every menses, (American college of obstetricians and gynaecologists, 2004). 16% had heavy intensity of flow during periods. 54% of the subjects had duration of menstrual cycle between 3-5 days, 43% had between 6-8 days and 3% had more than 8 days. As per the British journal of clinical obstetrics and gynecology, Ryan (2005) remarked that symptomatic women typically complain about

abnormal uterine bleeding, specifically in terms of heavy and prolonged bleeding. In a study by Wegienka et al., (2004) 'women with myomas were more likely to report a "gushing"-type of bleeding and high pad/tampon use than women without myomas'.

Infertility

Richards and Tiltman, 1998 specified that fibroids are also known to influence the contractility of the myometrium and induce a chronic inflammatory reaction, both of which may hinder implantation. According to Olive (2011) sub mucous fibroids are associated with recurrent spontaneous abortions. As per the study 11% of the subjects experienced difficulty in conceiving and 6 % had a history of abortion.

Pain

According to Dawood (1985) in the Journal of reproductive medicine women with uterine fibroids typically have spasmodic dysmenorrheal, with the uterus going into spasms as it tries to expel the large clots and excess blood. The extrusion of a sub mucosal fibroid polyp may be associated with "labour-like pains". 71 % of the subjects suffered from severe abdominal pain during menstruation and 50% experienced severe back pain.

Dietary pattern

Andrea (2016) indicated that hypovitaminosis D is associated with an increased risk of uterine fibroids. Vitamin D inhibits the growth and promotes the apoptosis of fibroid cells in in vitro studies and it seems to reduce the fibroid size in "in vivo" animal models. A study by Chiaffarino (1999) gave an account that consumption of beef and other red meat was associated with an increased risk of developing fibroids; and green vegetables and fish presented a protective effect. Martin et al described a positive association between vitamin A and myoma formation. Rose et al., (2010) reported that high dietary glycemic index and glycemic load may promote tumor genesis by increasing endogenous concentrations of insulin- like growth factor I (IGF-i) or the bioavailability of estrodiol.
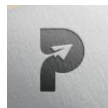
Table no: 1 dietary habits of the subjects

SI NO	CRITERIA	CATEGORIES	FREQUENCY	PERCENTAGE
1	Type of diet	Vegetarian	10	10
		Non vegetarian	90	90
2	Type of food like	Home made	98	98
		Outside food	2	2
3	Frequency of food from outside	Weekly	4	4
		Monthly	19	19
		Rarely	77	77
4	Do you skip meal	Yes	43	43
		No	57	57
5	If yes, which meal	Break fast	19	19
		Lunch	13	13
		dinner	11	11
6	Reason for skipping	Unavailability	3	3
		Dislike of food	17	17
		Lack of time due to work	11	11
		Loss of appetite	4	4
		other	8	8

Table no: 2 food frequency score of the subjects

FOOD ITEM	DAILY	ALTERNATIVELY	TWICE A WEEK	ONCE A WEEK	OCCASIONALY	NEVER
Cereals	100					
Pulses	38	29	18	8	7	
GLV	23	34	18	16	9	
Roots & tubers	28	34	22	8	5	3
Other vegetable	54	35	4	5	2	
Fruits	29	32	12	6	19	2
Milk & milk products	79	6		1	5	9
Fish	32	28	11	12	7	10
Meat & egg	8	25	24	27	11	10
Nuts and oil	52	15	6	10	16	1
Sugar	86	3			2	9

Majority of the subjects consumed green leafy vegetables, pulses and roots & tubers on alternative basis and fruits twice a week. 79% of the subjects consumed milk and milk products on a daily basis and 32% of the subjects consumed fish on daily basis, 27% of the subjects consumed meat and 24% consumed egg once a week. 52% of the subjects consumed nuts on a daily basis.

Table no: 3 comparison of nutritive value with rda

SI NO	NUTRIENTS	RDA	AVERAGE	PERCENTAGE
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	Βcarotene (IU)	4800	819.48	17.0625
8	Vitamin c(mg)	40	36.142	90.355
9	Folic acid(mg)	200	150.88	75.44

Average mean nutritive value indicates that 70% of the calorie requirement as per the RDA was met by the subjects. Protein by 88.29%, fat 86.13%, calcium 64.22%, iron 45.88%, retinol 27.09%, β carotene 17.06%, vitamin C 90.35% and folic acid 75.44% was observed in the study.
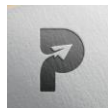
Conclusion

Uterine fibroids can lead to issues related to fertility and associated menstrual problems. The major risk factors associated with the incidence of leiomyoma as per the study were observed as obesity, heredity, age at menarche, decreased physical activity and dietary habits. The study recommends in following a healthy lifestyle and a micronutrient rich diet to prevent or delay the incidence of uterine leiomyoma.

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