Incorporation of Fenugreek and Sesame Seeds for Alleviation of Menopausal Symptoms

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ABSTRACT

The study was designed to evaluate the effect of phytoestrogen rich foods to improve menopausal dietary quality in alleviating menopausal symptoms. A total of n=1000 women (aged 35-48 years) were scanned. Of these, a sub sample of n=30 women, based on their severity of menopause rating scale (was obtained from the Professor Heinemann from Center of Epidemiology and Health Studies in Berlin) were purposively enrolled. To these subjects nutrition health education (NHE) was provided for 2 months (reinforced at 15 days interval), focused on sources of phytoestrogen and importance of consumption of phytoestrogen rich foods. Before and after NHE intervention data was collected for serum level of gonadotropin hormones (FSH and LH) estimation and menopause rating scale. The study revealed that in urban Vadodara 17.1% had menopause related symptoms. The baseline data for women in perimenopause state (n=30) showed the 24% were obese, 20% were overweight, 8% were undernourished. After intervention daily consumption pattern of phytoestrogen foods has increased from 6.9% to 15.2%; and that for the fenugreek seeds increased from 12% to 24% and for sesame seeds increased from 11.5% to 48%. The menopause rating scale was reduced from 0-32 to 0-17 after intervention. The improvement in consumption pattern of phytoestrogen foods has effectively shown significant reduction in the severity of symptoms for forgetfulness, swelling and weight fluctuation (p=0.01). The results of serum gonadotropin estimation showed that mean FSH was reduced from 18.03±5.01 to 10.95±3.55 and mean LH from 19.95±4.92 to 14.1±4.55, though this was not up to a satisfactory level. Phytoestrogens being nonsteroidal compounds with estrogenic activity showed a significant reduction in alleviating menopausal symptoms.

Keywords: Phytoestrogens, perimenopause, gonadotropin hormones, nutrition health education (NHE)

Phytoestrogens are natural compounds present in the food, with structural similarity as observed in human estrogen. Various studies carried out in vitro and animal experiments have shown that phytoestrogens bind weakly to the estrogen α-receptor and more strongly to the estrogen β-receptor and that they may possess tissue-specific estrogenic and anti-estrogenic effects (Nikander *et al.* 2003; Kuiper *et al.* 1998; Murkies *et al.*

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1998). Phytoestrogens at concentration of 100-1000 times higher than estradiol (the achievable levels in human plasma after regular phytoestrogens consumption) have been considered to be able to compete effectively with endogenous mammalian estrogens which bind to the ER and prevent estrogen stimulated growth in mammals (Adlercreutz H *et al*. 1992). Most of the identified phytoestrogen constituents consist of sterols, coumestans and isoflavonoids (Tilgner S. 2003). One study carried out to assess the effect of dietary phytoestrogens which included linseed, soy and wheat revealed that the outcomes of phytoestrogenic diets varied and gave tissue specific responses to the isoflavones and lignan present in soy and linseed respectively. In general it helped in ameliorating the menopausal symptoms (Dalais FS, 1997). The HPLC analysis of *Trigonella foenum-graecum* seeds Epidemiological studies comparing native Asian women to other cultures suggests that, high levels of dietary phytoestrogen may be responsible for their low rate of bone loss, breast cancer, and the ease with which Asian women pass through menopause (David S, 2000; Davis SR,2001.

Objective

The study was designed to evaluate the effect of phytoestrogen rich foods to improve menopausal dietary quality in alleviating menopausal symptoms.

Materials and Method

A total of n=1000 women (aged 35-48 years) were randomly scanned through ICDS, Anganwadi approach from low income group, of urban Vadodara. Potential research subjects (n=25) were screened using pre designed questionnaire, including the personal history, medical history, food frequency form and menopause related symptoms. The symptoms were observed and rated based on the MRS (Menopause Rating Scale) to know the experiencing degree of severity of menopausal symptoms. The Menopause Rating Scale (MRS) scale was obtained from Professor Heinemann, Center of Epidemiology and Health Studies in Berlin. The scoring scheme is simple, i.e. the score increases point by point with increasing severity of subjectively perceived symptoms in each of the 11 items (0 – no complaints, 4 scoring points – severity). The respondent provides her

personal perception by checking one of 4 possible boxes of "severity" for each of the items. Of these, based on their severity of menopause rating scale and serum level of gonadotropin hormones (FSH and LH), a sub sample of n=25 women, were enrolled for further study. Data on frequency of food consumption was taken with the help of a checklist containing an exhaustive list of cereals, pulses, GLVs, roots & tubers, other vegetables and fruits, which were rich of phytoestrogen and iron. Foods which were consumed daily, 2-3 times a week or atleast once a week, were categorized as frequently consumed. To these subjects, Nutrition health education (NHE) was provided for 2 months (reinforced at 15 days interval), focused on sources of phytoestrogen and importance of consumption of phytoestrogen rich foods. Women were significantly imparted education through IEC materials in their local language for major improvement of the menopausal symptoms occurring with ageing in the society. They were gathered at the anganwadi centers, and the sessions were made interactive with cross questioning among the subjects, to create more awareness and to motivate them. Post data was collected for serum hormone estimation and menopause rating scale after NHE intervention. Before and after the NHE intervention, blood samples were taken for all subjects. Serum was separated by centrifugation and stored frozen (-20c) until assayed for FSH and LH using validated routine laboratory analysis. The study was approved by Institutional medical Ethical Committee and informed consent was obtained. Statistical analysis was performed using SPSS software version 15.0.

Result and Discussion

It was found that, in urban Vadodara 17.1% women were in their perimenopause state and had menopause related symptoms (n=1000). Of these, a subsample of n=25 women was considered further for the study. The anthropometric data revealed that mean BMI of the women was 25.85±6.33, of which 24% were obese, 20% were overweight, 8% were undernourished. The consumption pattern of phytoestrogen and iron rich foods was assessed using a pre designed food frequency questionnaire. It was observed that the nutritional consumption was very poor initially due to lack of awareness. After intervention of nutrition health

education, daily consumption pattern of phytoestrogen foods has increased from 6.9% to 15.2% and consumption of iron rich foods has increased from 10.2% to 13.7%, as the subjects were provided information regarding beneficial effects to reduce the severity of menopausal symptoms (Fig. 1).
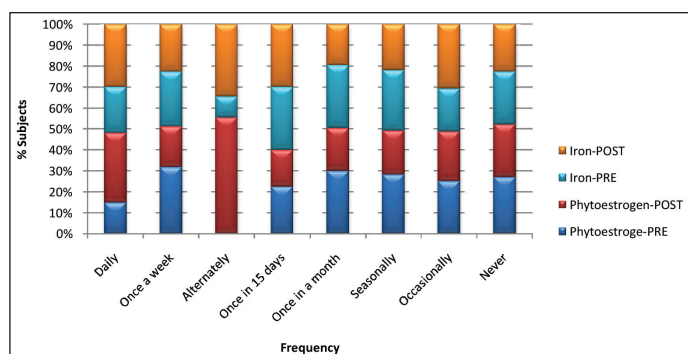

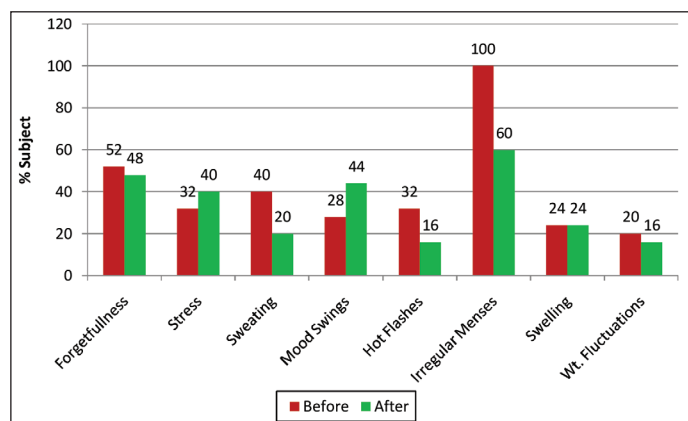**Fig. 1: Consumption pattern of phytoestrogen and iron rich foods**
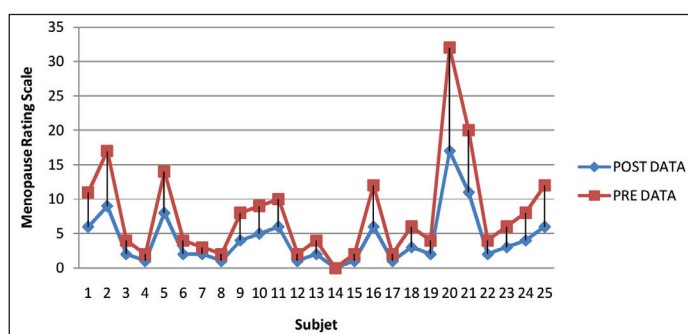

Fig. 2: Impact of NHE on menopausal symptoms

Fig. 3: Impact of NHE on menopausal rating scale (MRS)

Table 1: Consumption of phytoestrogen and iron rich foods in more and less frequency in women, before and after intervention

Food items	Before NHE (% Subject)		After NHE (% Subject)	
	Less frequently	More frequently	Less frequently	More frequently
Phytoestrogen rich foods				
Fenugreek seeds	60	40	40	60
Sesame seeds	53.6	46	0	100
Soy	96	4	72	28
Yam	80	20	20	80
Iron rich foods				
Rice flakes	24	76	16	84
Bengal gram	52	48	40	60
Wheat flour	0	100	0	100
Green gram, whole	28	72	24	76
Rice, puffed	32	68	16	84
Shepu	69	30.6	88	12

Owing to regular inputs of NHE, Fenugreek seeds were consumed either raw or added in some food items (10gm/ day) by few of the subjects. Sesame seeds were consumed more in the form of *chikki* and *laddus* or added in some food items (25-30gm/day). Yam was consumed once or twice in a month (100-150gm/ serving). Among soy products, soy flour was used, incorporated in the wheat flour to make chapattis, (1:4), soy chunks, soy granules, roasted soy, etc. but the taste and flavour of the soy was not much palatable, so it was not consumed more frequently among the subjects (Table 1).

The HPLC analysis of fenugreek seeds revealed the presence of isoflavones: daidzein-18.2ppm; genistein-11.8ppm and lignans: secoisolariceresinol-283.6ppm in non hydrolysed extract and presence of isoflavones: daidzein-100.9ppm; genistein-56.1ppm; lignans: secoisolariceresinol-1893ppm and coumestrol -170ppm in hydrolysed extract of fenugreek seeds. (Joshi M and Nair S, 2014).

The improvement in consumption of phytoestrogen rich foods has effectively shown reduction in menopause rating scale and severity of symptoms for forgetfulness (52% to 48%), sweating (40% to 20%), hot flashes (32% to 16%), weight fluctuations (20% to 16%), and irregular menses (100% to 16%) (p=0.01) (Fig. 2). The menopause rating scale reduced from 0-32 to 0-17 after intervention (Fig. 3).

The results of serum gonadotropin estimation showed that, mean FSH was reduced from 18.03±5.01 to 10.95±3.55 and mean LH from 19.95±4.92 to 14.1±4.55. The consumption of 45- 200 mg/dl soy isoflavones would decrease mid cycle FSH and LH in subjects who were on pre and post menopausal periods (Khani B *et al*. 2011). In our study, 32% population revealed 21% reduction in FSH and LH values, though it was not significant. Phytoestrogens may require some estrogens to become effective (Nikander *et al.* 2003). In our study, subjects may have had very less estrogen levels (hypoestrogenic) to bring an effective response in such a short span of time, thus accounting for variability in hormonal responses.

Conclusion

Phytoestrogens being nonsteroidal compounds with estrogenic activity showed a beneficial effect for alleviating menopausal symptoms.

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