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Impact of soya-based health food on climacteric symptoms of post-menopausal women

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ABSTRACT

The study was undertaken with an objective to assess the impact of soya-based health food on climacteric symptoms of post-menopausal women. Thirty eight post-menopausal women experiencing climacteric symptoms were purposively selected for the study and assessed for anthropometric profile, symptoms scores, knowledge level and biochemical parameters. Presence of climacteric symptoms and knowledge level were recorded by using pre-tested questionnaire. Out of these 12 women were randomly assigned to the experimental group and were provided with 40 g soya health food for a period of 90 days and equal number of them were age-matched and considered as control group. At the end of intervention reduction in mean menopausal symptom scores (19.84 to 18.61%) was observed in food intervention group when compared to control group (17.69 to 17.07%). Significant improvement was observed in food intervention group for total cholesterol (213.5 to 194.14 mg/dl), HDL-C (44.45 to 46.05mg/dl), LDL-C (136.96 to 119.37 mg/dl) and VLDL-C (32.08 to 29.10 mg/dl). Thus soya-based health food is useful in reducing menopausal symptom scores and improvement in lipid profile of post-menopausal women.

Keywords: Climacteric symptoms; isoflavones; post-menopause; phytoestrogen

INTRODUCTION

Post-menopausal phase begins when 12 full months have passed since the last menstrual period. This phase is recognized as a time of decreased hormonal production. As the result of fluctuating hormonal intensities menopausal women face the challenge of managing a barrage of symptoms both physiological and psychological as well as increased risk of age related diseases. Estrogen deficiency appearing at menopause is accompanied by rise in the levels of total cholesterol (6-11%), low density lipoprotein cholesterol (LDL-C), triglycerides and high density lipoprotein cholesterol.

Soyabean is the richest source of isoflavones viz diadzein, genistein and glycitein that form about 30, 60 and 8 per cent total isoflavone precursors in soyabean. Isoflavone resembles the estrogen structure. Indian soyabeans

contain on an average 2 mg of isoflavones per gram which is found to be useful in reducing the hormone related complaints connected to menopause. The study was therefore conducted to assess the impact of soya-based health food on climacteric symptoms of post-menopausal women.

MATERIAL and METHODS

The research study was conducted in the year 2009-2010 in Hubli, Dharwad city. A total of 38 post-menopausal women perceiving one or other symptoms willing to participate in the food based intervention were selected for the study by purposive sampling and basal data was collected by using pre-tested questionnaire. The subjects selected were divided into two groups viz control group (n= 12) and experimental group (n= 12). Soya-based health food developed in the department (Fig 1) was found to be effective for perimenopausal women (Goyal et al 2009). The soya health food provided 43 g protein and 80 mg of total isoflavones. Based on the studies in literature about the isoflavones needed by post-menopausal women each subject in experimental group was provided with 40 g of soya-based health food for a period of 90 days and were asked to consume 40 g everyday according to convenience. To confirm the regular consumption of food follow up was done from time to time. Each subject in experimental group was age-matched with the control subjects. In light of the objectives a pre-tested questionnaire was used to interview the post-menopausal women and the impact of intervention was assessed for anthropometric parameters and lipid profile. The data were analyzed with the help of suitable parameters like frequency, percentage, mean and standard deviation. The paired 't' test and student 't' test were used to test the significance of anthropometric parameters and lipid profile.

RESULTS and DISCUSSION

The data presented in Table 1 indicate that among 38 subjects majority of the women belonged to 51-55 years of age (63.16%). Most of the subjects were in secondary school category (42.11%) and about 55 per cent of women were housewives. Most of the women were married (86.84%) and belonged to nuclear family (78.95%) with 1 to 4 members in the family (71.05%). Half the subjects had more than Rs 15,000 income per month (50%) and very few belonged to the income of Rs <10,000 per month (7.9%). The findings of the Table 1 show that among 38 subjects most of the subjects had low and moderate knowledge (36.84% each). The results indicate that there is a need to educate the women about menopause.

The data projected in Table 2 show that waist/hip ratio did not show any difference among the groups viz experimental group (0.87) and control group (0.88) at the end of the study.

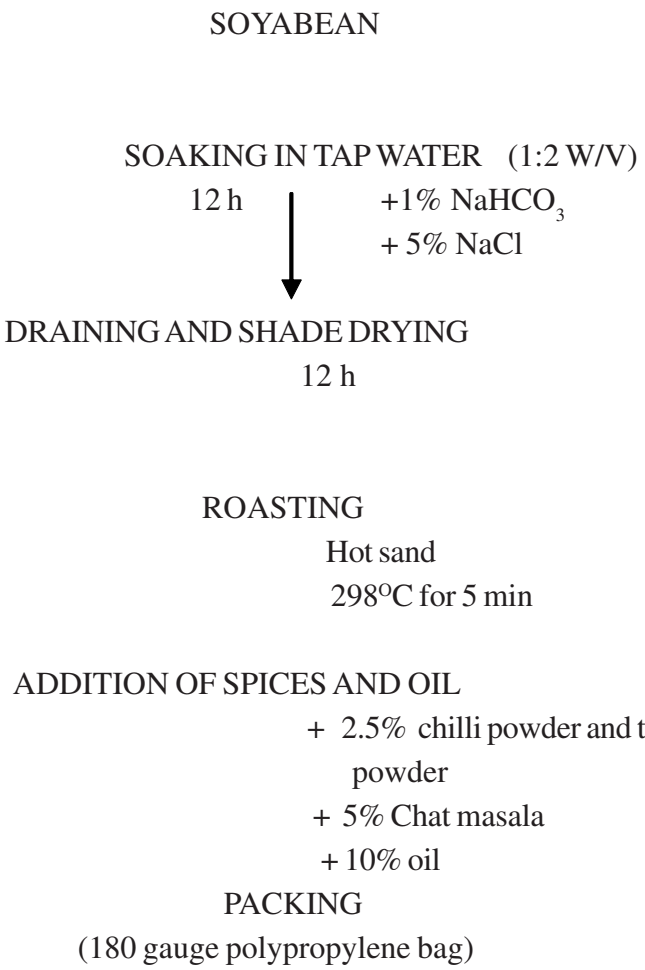

Fig 1. Flow chart for developed soya-based health food

Whereas slight increase was observed in anthropometric parameters viz weight, BMI, waist circumference and hip circumference at the end of the study. However none of the differences were found to be statistically significant.

Table 3 shows the impact of intervention on lipid profile of selected post-menopausal women. The mean total cholesterol, LDL-C and VLDL-C were reduced significantly in food intervention group (TC: 213.5 to 194.14 mg/dl, LDL-

Table 1. Demographic profile of post-menopausal women (n= 38)

Particulars	Frequency	Percentage
Age (years)		
45-50	9	23.68
50-55	24	63.16
>55	5	13.16
Education level		
Secondary	16	42.11
Higher secondary	8	21.05
Graduate	12	31.58
Post-graduate	2	5.26
Occupation		
Govt job	17	44.74
Housewife	21	55.26
Marital status		
Married	33	86.84
Unmarried	1	2.63
Widow	4	10.53
Family type		
Joint	8	21.05
Nuclear	30	78.95
Family size		
1-4	27	71.05
5-10	9	23.68
10-15	2	5.26
Family income/month (Rs)		
<10,000	3	7.9
10,000-15,000	16	42.11
>15,000	19	50
Knowledge score		
Low (<13)	14	36.84
Moderate (13-18)	14	36.84
High (>18)	10	26.32

Table 2. Impact of intervention on anthropometric profile of selected post-menopausal women (n= 24)

Anthropometric parameter	Intervention groups					
	Experimental (n=12)		Control (n=12)		't' test	
	Before	After	Before	After	Before	After
Weight (kg)	59±7.00	59.16±6.98	62.08±5.55	62.25±5.71	1.19^{NS}	1.18^{NS}
Paired 't' test	0.93^{NS}		1.07^{NS}			
Waist circumference (cm)	92.5±5.35	92.53±5.35	91.80±4.79	91.89±4.82	0.33^{NS}	0.30^{NS}
Paired 't' test	1.9^{NS}		1.9^{NS}			
Hip circumference (cm)	105.51±6.33	105.55±6.33	106.5±5.90	106.55±5.92	0.39^{NS}	0.39^{NS}
Paired 't' test	1.79^{NS}		1.8^{NS}			
Waist/hip ratio	0.87±0.06	0.87±0.06	0.88±0.09	0.88±0.09	0.96^{NS}	0.96^{NS}
Paired 't' test	1.60^{NS}		1.65^{NS}			
BMI (kg/m^2)	27.54±4.14	27.61±4.07	24.87±1.87	26.15±3.24	0.96^{NS}	0.96^{NS}
Paired 't' test	0.91^{NS}		1.14^{NS}			

NS= non-significant

Table 3. Impact of intervention on lipid profile of post-menopausal women (n= 24)

Blood parameter (mg/dl)	Intervention group					
	Experimental (n= 12)		Control (n= 12)		't' test	
	Before	After	Before	After	Before	After
Total cholesterol	213.5±32.50	194.14±32.07	240.86±39.39	239.31±39.68	1.85^{NS}	3.06*
Paired 't' test	4.67*		0.41^{NS}			
Triglyceride	160.64±71.37	143.58±52.37	189.73±48.61	186.18±54.18	1.16^{NS}	1.95^{NS}
Paired 't' test	2.12^{NS}		0.87^{NS}			
HDL-C	44.45±6.26	46.05±5.18	48.30±9.33	48.53±8.47	1.18^{NS}	0.86^{NS}
Paired 't' test	2.25*		0.37^{NS}			
LDL-C	136.96±31.69	119.37±28.71	154.61±33.02	148.07±38.46	1.33^{NS}	2.11*
Paired 't' test	3.86*		0.76^{NS}			
VLDL-C	32.08±14.29	29.10±11.20	37.94±9.73	37.26±10.82	1.17^{NS}	1.81^{NS}
Paired 't' test	2.21*		0.8^{NS}			

NS= non-significant, *Significant at 5% level

C: 136.96 to 119.37 mg/dl and VLDL-C: 32.08 to 29.10 mg/dl respectively) and the HDL-C values increased significantly after the study period (44.45 to 46.05 mg/dl). These values did not vary significantly in control group after the study. There was no significant difference in triglyceride levels in both the groups after intervention. When the lipid profile of the different intervention groups was considered before the start of intervention (initial) the difference in the means were found to be non-significant. At the end of the study the total cholesterol and LDL-C levels differed significantly in food groups when compared to control group (TC: food group vs control group: 194.14 mg/dl vs 239.3 mg/dl respectively and LDL-C: 119.37 mg/dl vs 148.74 mg/dl respectively). Similar results were found by Bakhtiary et al (2012) that may be attributed to higher arginine to lysine and methionine amino acid profile of soya protein, soya isoflavone and fibre content. The isoflavones present in the soya food have weak estrogen effect and possess antioxidant properties and help to reduce the lipid levels. Thus it can be concluded that soya-based health food is effective in reducing the menopausal symptoms and improving the lipid profile in post-menopausal women.

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