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Effect on Soyabean consumption on middle aged women

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Abstract
The overall health and well- being of mid aged women has become a major public health concern around the word. Especially during menopausal stage cardiovascular disease risk are very prominent. So best of our knowledge, we design a study to investigate the effect of soya bean consumption on body weight, BMI, Blood pressure & Lipid profile. In this study based on the inclusion and exclusion criteria subjects are selected in randomly, and instructed the selected subjects to follow the TLC diet with 25gms of soyabeans per day with the supply of natural estrogens which helps for the menopause women to combat their problems during the menopausal transition period. By the final analysis it is clear that there is a significant effect on lipid profile especially in the increasing the HDL levels.

Keywords: high density lipoprotein, low density lipoprotein, blood pressure, therapeutic lifestyle change diet

Introduction

Middle age is one of the turning point in one's life as it brings many changes. Middle age in women includes the gradual winding down of the reproductive system and ending of the child bearing years (Vijayalakshmi S, *et al.*, 2013) [5] i.e. menopause in women. Menopause is a natural part of the aging process in women and is defined as occurring 12 months after the last menstrual period and marks the end of menstrual cycles (Lzethe govie S, *et al.*, 2013). Menopause is a universal and physiological event in a women's life occurring around the age of 50 years in most developed countries (Farahmand M, *et al.*, 2013). It is caused by the aging of ovaries leading to a decline in the production of ovarian gonadotrophins estrogens and progesterones. The deficiency of these hormone elicits various somatic, vasomotor, sexual and psychological symptoms that impair the overall quality of life (QOL) of women (Ensiyeh J, *et al.*, 2015).

India has a large population, which has already crossed the 1 billion with 71 million people over 60 years of age and the number of menopausal women about 43million. Projected figures in 2026 have estimated the population in Indian will be 1.4 billion, people over 60 years 173 million and the menopausal population 103 million. Average of menopause is 47.5 years in Indian women with an average life expectancy of 71 years. The expert committee would like to highlight the problems in the country on the basis of the attitude relevant to menopause in the Indian context. These factors have to be borne in mind by health care workers when thy are dealing with menopausal women and making recommendations for their health and lifestyle changes (Jyothi Unni., 2016).

Undoudtedly, lifestyle is one of the most important factors affecting the health status, scientific evidence show that the choices and patterns of life style have influence on the health status and longevity, lifestyle encompasses various aspects that some of them include nutrition, exercise, self care, use of tobacco, alcohol and illegal drugs, social relationships and stress control. Statistics about the main causes of death indicates that 53% of the causes of death related to lifestyle and 21% of the causes of death related to environmental conditions and 16% of the causes related to genetics and 10% of the causes of death related to health care system. (Nosaybeh M, *et al.*, 2013).

The hormonal changes associated with menopause, e.g: low plasma levels of estrogen and marked increases in follicle stimulating hormone levels exert a significant effect on metabolism of plasma lipid and lipoproteins (Swapnali *et al.* & Kalavathiet, *et al.*, 2000). Increase in the incidence of cardiovascular disease is related to many risk factors such as increase in body weight, aging process, dyslipidemia, physical activity, mental stress, smoking and alcohol intake. As the incidence of CAD increase in women after menopause. Their is a correlation some of the risk factors associated with CAD to the hormonal changes taking place during menopause.

Estrogen replacement therapy is well established for the relief of climacteric symptoms in menopausal women as well as for the prevention of osteoporosis and cardiovascular diseases. Estrogen replacement therapy during menopausal transition improves a woman's health and quality of life. Isoflavones are a group of biological active compounds that have estrogenic and anti estrogenic effect depending on the target tissue. (Kaldas Rs, *et al.*, 1989)

Unfortunately majority of women are not aware of the changes brought about by menopause. The symptoms are directly resulted from depletion of estrogen level as women approaches menopausal stages and some of these women begin to experience these menopausal symptoms early in the perimenopausal phase. Clinical studies have shown that diet with supplementation of soy isoflavone is benefical in decreasing menopausal symptoms such as hot flashes (Kyung H, *et al.*, 2002)

With the increasing life expectancy women spends almost a

third of her life in menopause. Health issues of menopausal women therefore would pose a significant challenges to public health also considering the fact that there hasn't been a specific health program for such women in the country.

To compound the problem, the menopause symptoms are quite variable with multifactorial etiology. Studies on menopausal issue and health demand priority menopausal women and due to the growing population of menopausal women and due to varying presentation following influence of varied social and cultural pattern (Joseph, *et al.*, 2014).

The purpose of the study was to Evaluate the Effect of soyabean consumption on lipid profile and Blood pressure changes in middle age women 40 to 50 years of age.

Materials and Methods

In the present study 85 dyslipidemia subjects, in the age group 40 to 50 years were selected from Vijayawada urban area by stratified random sampling (purposive) method. The methodology consisted of administration of a pre tested questionnaire to the selected subjects to collect general information, Nutritional status: height, weight, Body mass index(BMI), Blood pressure, Lipid profile.

Each participants was explained the nature and purpose of the study and their written informed consent was obtained. All the subjects who participated in the study ere interviewed in the ward. They were selected randomly by certain Inclusion and exclusion criteria.

Inclusion Criteria

In the present study the participants are recruited based in the inclusion criteria i.e. (i) Women with age group of 40 to 50 years. (ii) having irregular cycles (amenorrhea) with showing menopausal symptoms. (iii) Elevated Lipid profile, subjects were recruited for the study.

Exclusion Criteria

Exclusion Criteria at baseline included, if they were pregnant, had a history of gastrointestinal hematologic disorder or taking medication that could interfere with hematopoiesis or absorption, hyper or hypo thyroidism, hysterectomized or ovariectomized women, hormone therapy, medications to significant affect on lipid lowering or under dieting.

Material used for the study, A well qualified and experienced dietitian instructed subjects to take a Therapeutic Lifestyle changes (TLC) diet which contains of 55% of CHO, 25% of fat, 20% of protein from the total energy of TLC diet containing 25gms of soyabeans. This TLC diet is advised to selected subjects and requested them to follow this diet continues for 3 months without fail.

At the beginning of the study baseline values for blood pressure, body weight, BMI and lipid profile were recorded. Boiled soyabeans 25 gms were administered to selected group respectively for 3 months. All the subjects were asked to follow similar dietary guidelines. After completion of study period estimated of blood profile, measurement of blood pressure and determination of body weight and BMI was done.

Limitations

Present study is worked in the local area with urban population. Some of the women refused to participated in the study because of their busy and some other psychological problems.

Statistical Analysis

Initial and final data was collected they were coded then analyzed. Result are expressed as numbers, percentage, mean, standard deviation, chi-square and comparative test was done to determine significance between numerical variable.

Results

Table 1: Socio demographic characteristics of participants:

Characteristics	number	%
Age		
40-44.12years	47	55.29
45-50 years	38	44.71
Marital status		
Married	73	85.8
Unmarried	1	1.4
Widow	6	7.0
Divorced	5	5.8
Religion		
Hindu	49	57.6
Christian	26	30.7
Muslim	10	11.7
Type of family		
Nuclear	48	56.6
Extended	7	8.2
Joint	30	35.2
Education level		
Illeturate	48	56.47
Primary	6	7.05
Metric	8	9.4
Middle	10	11.7
2+3	7	8.23
PG	6	7.05

The mean age of the participants are 43.9 years, the number of participants in between 40 years to 44years 12 months are 47 in number (55.29%) as well 45 to 50 years participants are 38 (44.7%) respectively. Above the half of women are married status 73 (85.8%), widow 6 (7.05%), divorced 5 (5.88%), unmarried 1 (1.17%) respectively.40 (57.6%) of participants are belong to religion Hindu, 26 (30.5%) are Christian and 10 (117%) are Muslims where as most of the participants are in nuclear family type 48 (56.47%), 30(35.29%) are joint, less number of 7 (8.23%) are in extended families. As well most of the participants above the half are the illeturates 48(56.47%), primary 6 (7.05%), metric 8(9.4%), middle 10(11.71%), 2+3 are 7(8.23%) and post graduation 6(7.05%) respectively.

Table 2: Anthropometric Data

Parameter	Study Type	Initial Data	Final Data	Mean Change %	Correlation	P Value
Height	Experiment	157.49, 7.38	157.49, 7.38			
	Control	162.41, 5.33	162.41, 5.33			
Weight	Experiment	76.18, 17.75	69.12, 12.4	9.26	0.88937	0.0006
	Control	77.81, 9.48	99.15, 10.2	-27.42	0.323002	0.002
Body Mass Index	Experimental	36.86, 19.02	27.96, 5.36	24.14	0.630009	0.001
	Control	28.95, 6.34	30.14, 6.79	-4.11	0.01159	0.001

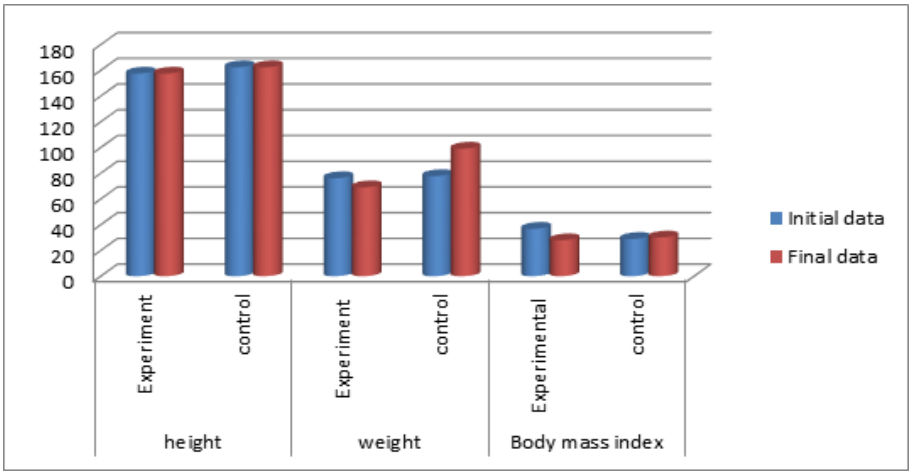

Fig 1: Anthropometric data

The mean height of experimental and control group is 157.49 and 162.41 respectively. A mean reduction of 9.26% of body weight is noticed in the experimental group and a significant decrease in body weight. A mean reduction of 24.14% of body mass index in the experimental group with a significant decrease in BMI.

Table 3: Blood Pressure

Parameter	Study type	Initial data	Final data	Mean change %	Correlation	P value
Diasystolic pressure	Experiment	88.6, 6.70	82.82, 8.55	6.52	-0.23538	0.030
	control	90.96, 7.19	89.35, 5.39	1.77	0.15033	0.162
Systolic pressure	Experiment	135.83, 8.03	127.69, 12.46	5.99	1.34736	0.0022
	control	141.27, 7.44	144.4, 11.51	2.21	0.015594	0.585

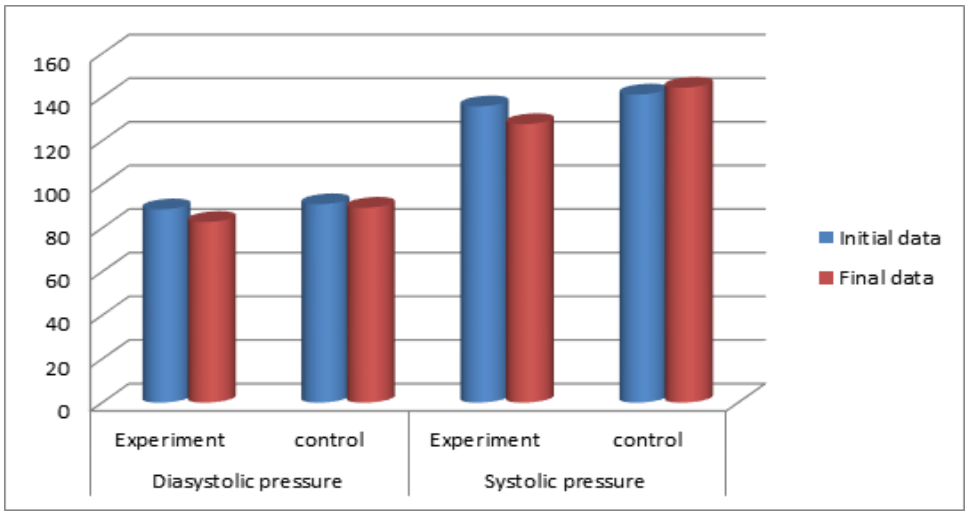

Fig 2: Blood pressure

The mean drop of 6.52% was recorded in diasystolic blood pressure in the experimental group and mean fall of 1.77% in the control group and is not significant. The systolic blood pressure of the experimental group showed a mean reducation of 5.99% with a significant and mean increase of 2.21% of control group.

Table 4: Blood lipid profile

parameter	Study type	Initial data	Final data	Mean change %	Correlation	P value
Total cholesterol	Experiment	258.72, 30.5	244.7, 27.19	5.41	0.260704	0.015
	control	271.89, 43.5	271.73, 44.8	0.058	0.13646	0.058
Triglycerides	Experiment	223.02, 52.7	219.8, 45.08	1.44	0.331655	0.005
	control	212.96, 49.5	218.2, 49.8	2.46	0.13359	0.214
HDL	Experimental	25.91, 7.03	34.83, 11.78	34.42	0.1958150	0.005
	control	26.8, 8.15	25.01, 12.4	6.67	0.0358651	0.740
LDL	Experiment	176.7, 37.2	164.6, 38.8	6.84	0.04989	0.065
	control	191.4, 43.9	195.6, 44.7	2.22	0.092417	0.391
VLDL	Experiment	52.12, 15.0	49.4, 17.9	5.18	0.09649	0.155
	control	50.8, 13.2	47.8, 14.1	5.74	0.339117	0.001

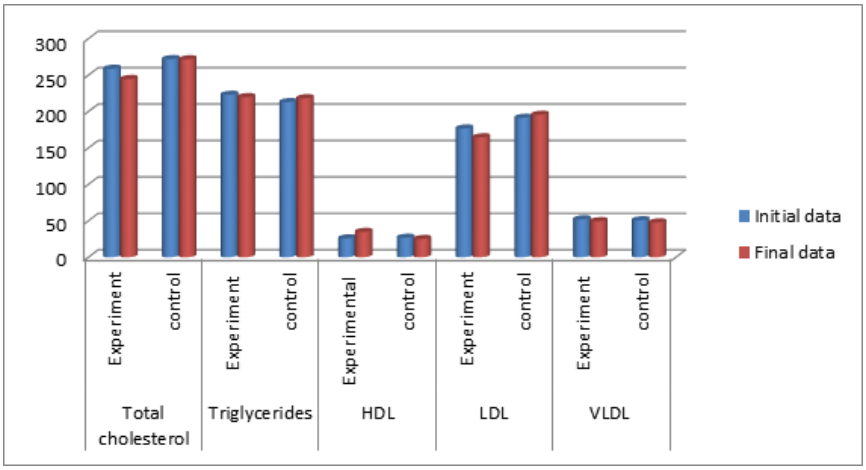

Fig 3: Lipid profile

Lipid profile plays a key role in the present study. There is mean drop of 5.41% in total cholesterol of experimental group and there is no significant changes in control group as well in triglycerides 1.44% of mean fall in the experimental group, 2.46% of increases in control group. Where as in the HDL 34.42% of mean rise in the experimental group, 6.84%, 5.18% of mean drop in LDL & VLDL respectively in the experimental group. These shown that there is a significant effect of isoflavone consumption in the plasma lipid profile of the experimental group.

Discussion

In the present study total selected subjects is divided into 2 groups as experimental and control groups. Formulated TLC diet with 25gms soyabeans is instructed to the selected experimental group for 3 months. Interventions were well tolerated by subjects and the dropout rate was minimum. In the present study consumption of soybean to dyslipidemia subjects resulted in a significant changes in body weight, Body mass index, Systolic and diasystolic Blood pressure and finally lipid profile.

According to Jousilahti P *et al.* and Smith DC *et al.*, the biological effects of estrogen replacement therapy are numerous, but the most likely mechanism to explain its protective effect on cardiovascular disease is its ability to alter lipid and lipoprotein levels. But along with these benefits there are certain risk factors of estrogen replacement therapy. High doses of estrogen for moderately long period increase the risk of endometrial carcinoma.

In the present study natural estrogen present food such as soyabean as isoflavone are used as a formulated food for the selected subjects. We identified that there is a significant reduction of LDL, total cholesterol and triglycerides and increase of HDL. The increased HDL shows the beneficial effect on lipid profile. Zeinab Nourieh, *et al.* showed that soy milk could reduce LDL-C without changing other serum lipid indices among adult with normal lipid profile. In contrast to other fats, soy milks fat did not have any adverse effect. In the present study whole soya in the form of boiled soya showed significant in lipid profile with the natural soya isoflavones.

Conclusion

The overall health and well- being of mid aged women has become a major public health concern around the word. Especially during menopausal stage cardiovascular disease risk are very prominent. So best of our knowledge, we designa study to investigate the effect of soyabean consumption on body weight, BMI, Blood pressure & Lipid profile. By the final analysis it is clear that there is a significant effect on lipid profile especially in the increasing the HDL levels.

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