Effect of celery seed supplementation on the anthropometric measurements and serum lipid profile of Hypercholesterolemic subjects

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ABSTRACT *Good health is a challenge of modern – day living as the current civilization is plagued by several degenerative lifestyle diseases. Hypercholesterolemia continues to be one of the major risk factors associated with coronary artery diseases. It is generally established that the nutritive and non- nutritive constituents of food can be used to modify the risk of developing or aggravating human disease condition and for maintaining optimum health state. Plant components (leaves, flower, bark, seed and root) have gained attention as they have been identified and used in the treatment of various diseases.Clinical studies have demonstrated the relationship between diet, nutrients and blood lipid profile; blood pressure and coronary artery diseases. Celery seed is a novel food source that possesses various potential health benefits. The seed are comprised of various components such as flavonoids, coumarins, linolenic acid and 3n-butylphthalide which work synergistically to fight against a number of ailments. The present study is carried out to investigate the effect of celery seed supplementation on the serum lipid profile of hypercholesterolemic subjects and to highlight the potential of celery seed as a therapeutic medicinal food.*

INTRODUCTION

Non – communicable diseases continue to be an important public health problem in India, and are intricately linked to globalization, urbanization and lifestyle transitions. The burden of these diseases occurs in the productive mid- life period and will, therefore, adversely affect the work productivity and also the economic development (Graffar et al., 2004).The industrial revolution in the last 200 years has introduced radical changes in methods of food production, processing and storage. Economic development together with recent technological innovations and modern marketing techniques have modified dietary preferences, and consequently, led to major changes in the composition of diet. There is a shift towards high fat, refined carbohydrates and low fibre diet (Popkin, 1998). Strong evidence shows that an unhealthy diet and insufficient physical activity are among themajor causal factors in the development of coronary heart disease, cerebrovascular strokes, and several forms of cancer,type 2 diabetes, hypertension, obesity and other conditions (Insel et al, 2003).

Nutrition and food science have contributed to the enhanced development of an abundant, nutritious and safe food supply supporting better health for people around the world.It is generally established that the nutritive and non- nutritive constituents of food can be used to modify the risk of developing or aggravating human disease condition and for maintaining optimum health state. Plant components (leaves, flower, barks, seed and root) have gained attention as they have been identified and used in the treatment of various diseases.Clinical studies have demonstrated the relationship between diet, nutrients and blood lipid profile; blood pressure and coronary artery diseases.

Celery has been used as an anti-helminthic, antispasmodic and diuretic. In the medicinal- herbal market celery oil as well as ground seed are touted as dietary supplement that promotes and regulate healthy blood pressure, joint pain and for sufferers of gout as celery seed appears to lower the production of uric acid.

Maintaining normal weight and adequate physical activity throughout the life span are the most effective ways of preventing coronary artery disease and many other chronic diseases (WHO, 2002). Hence due to the wide prevalence of non- communicable diseases effective food based strategies needs to be implemented to prevent the occurrence of these degenerative diseases.

METHODOLOGY

Design of the study

The present study was designed to study the effect of celery seed supplementation on the serum lipid profile of hypercholesterolemic subjects. The experimental design adopted for the study was a "pre - test and post- test" design with control. The approval of the independent ethics committee was obtained for carrying out the study.

Sample size and sampling technique

The subjects who participated in the study were selected based on convenience sampling technique. The total sample size for the study was 24 hypercholesterolemic subjects who were divided randomly into two groups- Group I(12 hypercholesterolemic subjects served as the test group) and Group II (12 hypercholesterolemic subjects served as controls).

Criteria for sample selection

- Male and female subjects in the age group 35-55 years.
- Subjects with cholesterol levels between 200-300mg/dl.
- Subjects should not be suffering from any other relevant medical complications.
- Subjects should not be on any drugs.
- Willingness of the subjects.

Duration of the study and parameters measured during the study

The study was carriedout for a period of 60 days. Anthropometric measurements such as height, weight, BMI, waist circumference and serum lipid profile were analyzed before

the commencement of the supplementation and after the period of supplementation for subjects in both the groups.

Administration of the supplement

The supplement used for the study was celery seed. The seeds were roasted well for a few minutes after which it was powdered. 150 mg of the celery seed powder was measured and packed in self- lock covers and given to subjects in the experimental group. They were asked to consume it along with 150 ml of water after breakfast for a period of 60 days. The subjects in the control group did not receive any supplement.

RESULTS AND DICUSSION

Table 1

Comparison of the mean reduction/increment in Body Mass Index (BMI) and waist circumference between group I and group II after the supplementation/study period.

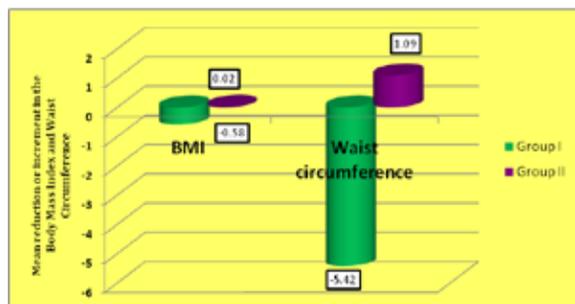| Parameter	Mean increment/ reduction (after 60 days)		't' value	Level of Significance
	Group I	Group II		
Body Mass Index (Kg/m^2)	↓ 0.58± 3.56	↑0.02± 3.12	1.118	NS
Waist circumference (cm)	↓ 5.42± 1.62	↑1.09± 2.90	0.232	NS

NS – Not Significant

Fig.1. Comparison of the mean reduction/increment in the anthropometric measurements between group I and group II after the supplementation/study period.

From the above table, it can be inferred that the mean reduction in the Body Mass Index of the subjects in group I was -0.58 ± 3.56 Kg/m^2, while the mean increment in the Body Mass Index in group II was 0.02± 3.12 Kg/m^2. From the mean values it can be seen that there was a small decrease in the BMI in group I that received the celery seed supplementation, but when the mean reduction/increment in Body Mass Index was compared between the groups it was not found to be statistically significant.

It is evident from the table that the celery seed supplementation was instrumental in bringing about a reduction in the waist circumference of the subjects in group I by -5.42 cm. On the other hand there was a mean increment in the waist circumference of group II subjects by 1.09 cm. When the mean reduction/increment in the waist circumference was compared between group I and II there was no statistically significant difference.

Table 2

Comparison of the mean reduction/increment levels in the serum lipid profile between group I and group II af-

ter the supplementation period.

Parameter (mg/dl)	Lipid profile		't' value	Level of significance
	Before Mean ± S.D	After Mean ± S.D		
Total cholesterol	↓ 31.01 ± 31.07	↑ 1.42 ± 24.79	1.909	NS
Triglycerides	↓ 41.41 ± 32.00	↑ 9.46 ± 50.04	1.335	NS
HDL- cholesterol	↓3.72 ± 9.72	↓ 1.18 ± 8.38	-1.109	NS
LDL- cholesterol	↓ 22.78 ± 23.13	↑ 2.60 ± 24.12	1.395	NS
VLDL- cholesterol	↓ 8.28 ± 6.34	↑ 0.24 ± 7.75	2.151	1%

NS – Not Significant

From the above table, it can be inferred that the mean reduction in the serum total cholesterol of the subjects in group I at the end of the supplementation period was found to be -31.01 ± 31.07 mg/dl whereas there was a mean increment in serum total cholesterol of subjects in group II by 1.42 ± 24.79 mg/dl. When the mean reduction/increment in the serum total cholesterol levels was compared between group I and group II at the end of the supplementation/study period there was no statistically significant difference.

The mean serum triglyceride of the subjects in group I showed a reduction by - 41.41 ± 32.00 mg/dl at the end of the supplementation period, while the subjects in group II showed an increment by 9.46 ± 50.04 mg/dl. When the mean values were compared between group I and group II there was no statistically significant difference.

The subjects in group I showed a mean reduction in the serum HDL-C levels by -3.72 ± 9.72 mg/dl at the end of the supplementation and the subjects in group II showed a mean increment by 1.18 ± 8.38 at the end of the study. When the mean reduction/increment in the serum HDL -C levels was compared between group I and II, the difference was not found to be statistically significant.The LDL-C levels of the subjects in group I decreased by - 22.78 ± 23.13 mg/dl at the end of the study period, while in group II who did not receive the supplementation the LDL-C levels increased by 2.60 ± 24.12 mg/dl. When the mean reduction/reduction in LDL-C levels was compared it was not found to be statistically significant.

The VLDL-C levels showed a decrease of - 8.28 ± 6.34 mg/dl in group I at the end of the supplementation while there was an increment of 0.24 ± 7.75 mg/dl in group II at the end of the study. When the mean increment/reduction in VLDL levels was compared it showed a statistically significant difference at 1 % level.

SUMMARY

Non – communicable diseases are the biggest global killers today accounting for 60 percent of all deaths worldwide, with 80 percent of those taking place in the developing countries where they take a disproportionate toll during the ages of prime productivity. The prevalence of dyslipidemia is also increasing at an alarming rate. Hence the primary focus is to achieve and maintain normal cholesterol levels in order to prevent or delay further complication. With this perspective, the present study was designed to determine the effect of celery seed supplementation on the anthropometric measurements and serum lipid profile of hypercholesterolemic subjects.

CONCLUSION

From the results obtained from the study, it can be concluded that the hypercholesterolemic subjects in group I experienced significant decrease in the anthropometric

measurements such as waist circumference, body mass index and serum lipid parameter while, the subjects in the control group experienced increment in the anthropometric measurements (waist circumference and body mass index), and serum lipid parameters after 60 days of supplementation/study period. This study has brought to light the hypolipidemic effect of celery seed supplementation and hence can play a significant role in the treatment of dyslipidemia which is responsible for the alarming rise in CHD mortality and morbidity rates.

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