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EFFECT OF DRUMSTICK (*MORINGA OLIEFERA*) LEAVES POWDER CHUTNEY ON BLOOD PRESSURE

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ABSTRACT

Present investigation was carried out to study the effect of drumstick (*Moringa oleifera*) leaves powder on blood pressure. *Moringa oleifera* is the most widely cultivated species of a monogeneric family, the Moringaceae, that is native to the sub-Himalayan tracts of India. Chemical compounds present in drumstick leaves are quercetin, antioxidants, phytochemicals and pharmacological factors. Drumstick leaves can be eaten fresh, cooked, or stored as dried powder for many months without refrigeration, and reportedly without loss of nutritional value. Thus an attempt was made to prepare drumstick leaves powder chutney utilizing Bengal gram dal powder, Black gram dal powder and Niger seed powder to ensure minimum four gram consumption of drumstick leaves powder in the daily diet. Twenty hypertensive subjects were selected for clinical study. They were divided in to two groups, experimental and control. Each groups consist of 20 subjects. The supplementation of 20 gm of drumstick leaves powder chutney (containing 4 gm of drumstick leaves powder) was given daily for a period of 60 days to the experimental group. The observations of blood pressure were recorded at 0, 30 and 60 days of the experimental period. The supplementation of drumstick leaves powder chutney showed improvement in the blood pressure levels, systolic (131 mm Hg to 116 mm Hg) and diastolic (86 mm Hg to 78 mm Hg) at the end of experimental period. This novel utilization of abundantly available drumstick leaves can be en-cashed as a value added product which is associated with healthy life by reducing blood pressure.

Key words: Drumstick leaves powder chutney, supplementation and blood pressure.

INTRODUCTION

Drumstick leaves has enormous potential for benefiting humanity. India's ancient tradition of ayurveda says the leaves of the Moringa tree prevent 300 diseases. Scientific research has proven that these humble leaves are in fact a powerhouse of nutritional value. Besides it contains phytochemical having potent anticancer and hypotensive activity may be attributed to the presence of quercetin.

Nutritionists are now trying to encourage cultivation and incorporation of GLVs in various recipes with minimum effort and little cost, yielding a great benefit. Devising several simple and acceptable micronutrient rich recipes containing GLVs would not only bring variety to the diet but also help in combating micronutrient deficiencies. In developing countries where most of the people are engulfed in poverty and cannot afford the expensive food products and suffer from various deficiency diseases, need to identify cheap and easily available source rich in micronutrients is essential. Less utilized leaves of drumstick, which are rich in micronutrients but are mostly discarded or go waste were used in traditional Indian recipes and evaluated for their acceptability among children.

Dehydration is one of the technique which results in concentration of nutrients. The abundantly available

inexpensive leaves of drumstick leaves can serve as a pool house of nutrients and can be used in the developing countries to combat micronutrient deficiencies. Except few studies, data on reduction in blood pressure by medicinally important plants is scanty. Through this study the less utilized leaves of drumstick leaves, which are rich in micronutrients but are mostly discarded or go waste were researched to explore the effect of drumstick leaves powder chutney on the blood pressure in hypertensive subjects.

MATERIALS AND METHODS

The present study was designed to evaluate the utilization of health benefit of supplementation of drumstick leaves powder chutney on hypertensive subjects. The study was carried out in the Department of Foods and Nutrition, College of Home Science, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani (M.S.). The ingredients used for preparation of chutney were Drumstick leaves powder, Bengal gram dal powder, Black gram dal powder, Niger seed powder and constant amount of Jaggery, Tamarind and Chilli powder.

Total numbers of twenty hypertensive subjects were selected following the purposive sampling technique. They were divided in to two groups experimental group (10) and control group (10). The selected subjects were

allowed to continue follow their usual living style, diet, exercise and medicines during the study period. The experimental group was supplemented 20 gm of drumstick leaves powder chutney for a period of 60 days where as control group did not received drumstick leaves powder chutney. Periodic observations of blood pressure were recorded 0,30 and 60 days for both the group using Sphygmomanometer (Steidl and Bratton, 1968). The recorded values were consolidated, tabulated and analyzed statistically and summarized.

Table 1: Blood pressure of experimental group before and after supplementation (n=10)

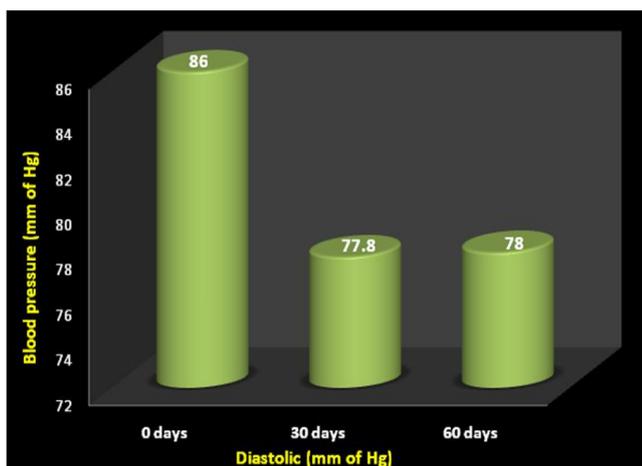
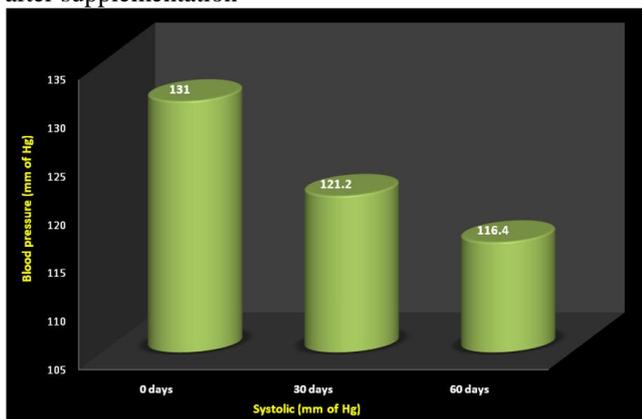
Blood pressure	Zero days (Before)		30 days		60 days (After)	
	Range	Mean ± SE	Range	Mean ± SE	Range	Mean ± SE
Systolic (mm of Hg)	120-150	131 ± 3.14	110-140	121.2 ± 3.10	110-122	116.4 ± 1.75
Diastolic (mm of Hg)	80-90	86 ± 1.63	70-90	77.8 ± 1.98	70-90	78 ± 2.02

‘t’ values of blood pressure (students paired ‘t’ test)

Days	Systolic (mm of Hg)	Diastolic (mm of Hg)
Zero Vs 30	2.22 NS	3.19*
30 Vs 60	1.34 NS	0.07 NS
Zero Vs 60	4.05**	3.08*

* -Significant at 5 % level, ** - Significant at 1 % level, NS non significant

Fig 1: Blood pressure of experimental group before and after supplementation



Initially the mean recorded value for systolic blood pressure was 131 ± 3.14 mm of Hg and diastolic pressure was 86 ± 1.63 mm of Hg. After 30 days of supplementation of drumstick leaves powder chutney the value of systolic blood pressure was found to decrease to 121.2 ± 3.10 mm of Hg and that of diastolic blood pressure

RESULTS AND DISCUSSION

The mean values of systolic and diastolic blood pressure of the experimental group before (0 days) and after (30 and 60 days) supplementations are presented in Table 1 and illustrated in Figure 1. The subjects were found to have the initial value of systolic and diastolic blood pressure in the range of 120 - 150 mm of Hg and 80 - 90 mm of Hg respectively.

was found to be decrease to 77.8 ± 1.98 mm of Hg. The difference in systolic blood pressure at 30 days from their initial values showed statistically non significant while it was significant in diastolic blood pressure (P< 0.05).

When supplementation was continued up to 60 days a further slight reduction in the value of blood pressure was noticed. The mean value of systolic blood pressure of 116.4 ± 1.75 mm of Hg and that of diastolic blood pressure 78 ± 2.02 mm of Hg were recorded at the end of 60 days period of supplementation of drumstick leaves powder chutney.

When the values of 60 days were compared with the values obtained at 30 days of supplementation of drumstick leaves powder chutney the difference noticed was non significant for systolic blood as well as for diastolic blood pressure. Further the initial and final values of systolic and diastolic blood pressure were compared; the statistically significant result was noticed.

It is evident from the results that increase in the period of study decreased progressively the systolic as well as diastolic blood pressure. The results of statistical analysis showed significant decrease in systolic and diastolic blood pressure after 60 days of supplementation.

Similar effect of *Moringa* leaves has been reported by Juzwiak *et al.*, (2005), Kamada *et al.*, (2005) and Anwar *et al.*, (2007). The results of the present study demonstrated the utility of drumstick leaves powder chutney in controlling hypertension. The marked reduction observed in the values of blood pressure with supplementation of drumstick leaves powder chutney may be attributed to the presence of quercetin.

The changes in the mean values of blood pressure of experimental and control group before and after supplementation of drumstick leaves powder chutney are presented in Table 2 and illustrated in Figure 2.

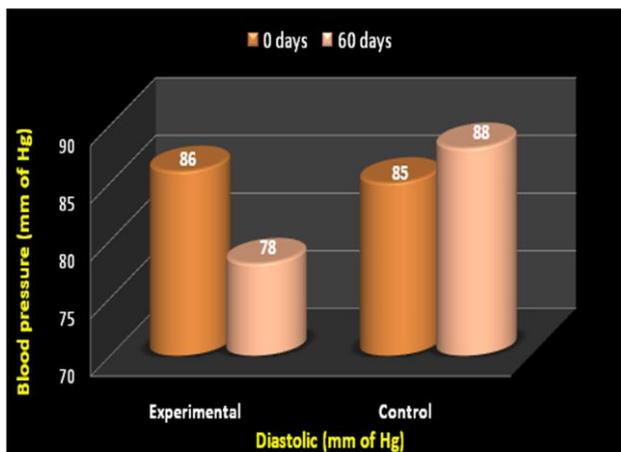
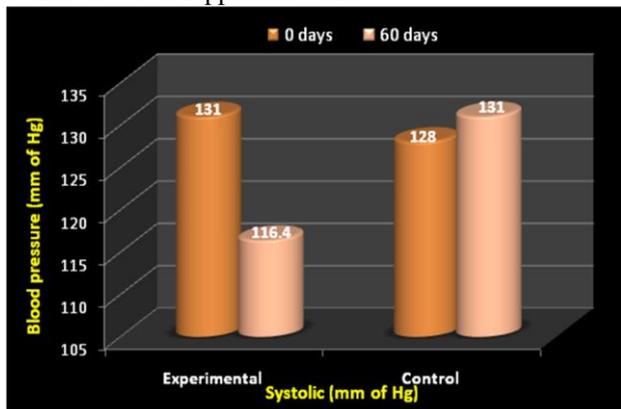
Table 2 - Blood pressure of experimental and control group before and after supplementation (n=20)

Blood pressure	Mean \pm SE		Difference	't' value	
	Initial (0 days)	Final (60 days)		I vs F (0 Vs 60 days)	E Vs C (60 days)
Systolic (mm of Hg)					
Experimental	131 \pm 3.14	116.4 \pm 1.75	14.6 \pm 1.39	4.05**	4.96**
Control	128 \pm 2.49	131 \pm 2.56	3.00 \pm 0.07	0.83 NS	
Diastolic (mm of Hg)					
Experimental	86 \pm 1.63	78 \pm 2.02	8.00 \pm 0.39	3.08*	2.95*
Control	85 \pm 2.23	88 \pm 2.71	3.00 \pm 0.48	0.85 NS	

I – Initial, F – Final, E – Experimental, C- Control

* -Significant at 5 % level,** -Significant at 1 % level, NS - non significant

Fig 2: Blood pressure of experimental and control group before and after supplementation



The results of supplementation of drumstick leaves powder chutney indicated the decrease in systolic (14.6 \pm 1.39) and diastolic (8.00 \pm 0.39) blood pressure in case of experimental group at 60 days when the initial blood pressure values were compared with final blood pressure values the mean decrease in systolic and diastolic blood pressure was found to be statistically significant (P<0.01) and (P<0.05) respectively. On the contrary the respective values recorded for control group were non significant (P>0.05). Comparison of the mean decrease in systolic and diastolic blood pressure between the experimental and control group showed significance (P<0.01) and (P<0.05) respectively.

Results of present study are in accordance with the findings of Rajangam *et al.*, (2001) and Essa *et al.*,

(2006). The results of the present study demonstrated the utility of drumstick leaves powder chutney in controlling hypertension. The marked reduction observed in the values of blood pressure with supplementation of drumstick leaves powder chutney may be attributed to the presence of quercetin.

CONCLUSION

It is evident from the result that increase in the period of experiment decreased progressively the systolic as well as diastolic blood pressure. The results of statistical analysis showed significant decrease in systolic and diastolic blood pressure after 60 days of supplementation. The efficacy of supplementation of drumstick leaves powder chutney may be attributed to the presence of phytochemicals as it produces definite physiological action on human body in combination with nutrient and fibre and protect against the diseases. Phytochemicals manage the health problems without side effects in a natural way. The mean decrease in systolic and diastolic blood pressure between the experimental and control group showed significant at 1 per cent and 5 per cent level respectively.

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