

Effect of supplementation of garlic and cinnamon in hypertensive subjects

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Received: 29.04.2015; Revised: 04.11.2015; Accepted: 14.11.2015

■ **ABSTRACT :** The study was undertaken to assess the effect of garlic and cinnamon in hypertensive subjects. Garlic powder contains allicin and cinnamon contains cinnamonaldehydes. They have the hypertension reducing property. A sample of 60 hypertensive subjects was selected purposively. Their information regarding socio-economic status and health status was collected through questionnaire. They were divided into two groups, experimental and control, 30 in each group. The blood pressure reading was taken initially for all the 60 subjects. The prepared garlic powder and cinnamon powder was given to experimental group continuously for 60 days and told them to use in a day in any recipe or cinnamon powder can be taken in a coffee or tea. Reading of systolic and diastolic blood pressure at 0, 15, 30, 45 and 60 days were recorded for both the groups. The collected data was analysed statistically and it was concluded that the consumption of 0.5 g of dry garlic powder and 0.5 g of cinnamon powder continuously for 60 days has positive effect in hypertensive subjects. Consumption of garlic and cinnamon powder had significantly positive results than only consumption of garlic powder.

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■ **KEY WORDS:** Hypertension, Systolic and diastolic blood pressure, Cinnamon, Garlic, Hypertensive subjects

■ **HOW TO CITE THIS PAPER :** Farzana, Farooqui Hafeez (2015). Effect of supplementation of garlic and cinnamon in hypertensive subjects. *Asian J. Home Sci.*, **10** (2) : 395-399.

High blood pressure is a potentially dangerous problem suffered by many people, often being unaware of it. It has estimated that in USA alone more than 50 million people suffer from high blood pressure. The World Health Organization has estimated that high blood pressure causes one in every eight death worldwide making the hypertension the third leading killer in the world. Every individual has blood pressure, which is necessary to move blood through arteries and to provide oxygen to the tissues of the body. Hypertension is elevated blood pressure. WHO defines

hypertension is a condition in which systolic pressure exceeds 160 mmHg and diastolic pressure exceeds 95 mmHg. With diastolic pressure of 100 or more therapy should be initiated with drugs as well as diet.

Hypertension impairs the pumping function of the heart and if untreated damage to heart, brain and kidney. Stroke occurs more often in patients with high blood pressure. The functional groups in garlic and cinnamon have to be effective in treatment of hypertension.

Garlic contains allicin, which relax the blood vessels due to which reduced blood pressure and damage

to the walls of blood vessels. Cinnamon contains cinnamaldehydes. Cinnamaldehydes has been found to have anti-clotting action, prevents platelet clogging inside the blood vessels and thereby helps to prevent stroke, peripheral arterial and coronary artery diseases.

Cinnamon has the highest anti-oxidant strength of all the sources in nature. The total measured ORAC (oxygen radical absorbance capacity) value for this novel spice is 267536 Trolox equivalents (TE) which is many hundred times more than chokeberry and apples.

Due to their important functional properties, the garlic and cinnamon powders were taken to find out the effect of supplementation on hypertensive subjects.

■ RESEARCH METHODS

A group of sixty hypertensive subjects of age group 40-80 was purposively selected. Their information about socio-economic status and health status was collected through questionnaire. They were divided into two groups, experimental and control, 30 in each group. The prepared garlic and cinnamon powder was given to experimental group only for 60 days. The blood pressure was recorded at 0, 15, 30, 45 and 60 days for all the subjects. The collected data was analyzed statistically and results of garlic and cinnamon on hypertensive subjects were studied. Another study, which was conducted previously to see the effect of supplementation of garlic chutney on hypertensive subjects, that data was also compared with this study and results were studied.

■ RESEARCH FINDINGS AND DISCUSSION

Chemical composition of garlic and chemical composition of cinnamon (per 100g) is given in Table 1 and 2.

It is clear from Table 3 that 50 per cent subjects of experimental group belonged to age group 40 to 60 yrs and 50 per cent belonged to 61 to 80 yrs of age. In control group 53.33 per cent belonged to 40 to 60 yrs and 46.66 per cent belonged to the age group 61 to 80 yrs. The experimental group comprised 33.33 per cent male and 66.66 per cent female whereas the male and female percentage in control group was 23.33 and 76.66, respectively.

In experimental group, 53.33 per cent were from nuclear family and 46.66 per cent from joint family. In control group, 30 per cent were from nuclear family and

Table 1 : Chemical composition of garlic (100 g)

Nutrient	Amount
Moisture	62 g
Energy	145 kcal
Protein	6.3 g
Lipids	0.1 g
Carbohydrates	29.8 g
Fibre	
Manganese	0.86
Potassium	-
Sulphur	-
Calcium	30 mg
Phosphorus	310 mg
Iron	1.2 mg
Magnesium	71 mg
Sodium	-
zinc	1.93 mg
VitaminB ₁	0.06 mg
VitaminB ₂	0.23 mg
VitaminB ₃	0.4 mg
Vitamin C	13 mg

Source : NIN ICMR 1989 (Reprint 2012)

70 per cent from joint family.

In this study, 20 per cent illiterate, 33.33 per cent educated up to school education and 46.66 per cent were educated up to college education in an experimental group, whereas in control group 26.66 per cent illiterate, 43.33 per cent educated up to school education and 30 per cent were up to college education. In experimental group, 33.33 were homemakers, 26.66 had service and 40 per cent had business. In control group 30 per cent were homemakers, 30 per cent had service and 40 per cent had business.

It is clear from the table that 13.33 per cent subjects had family income < Rs. 10000, 26.66 per cent had > Rs. 10000- < Rs. 15000 and 60 per cent had more than >Rs. 15000 to 20000 per month in experimental group. Whereas the income of 10 per cent subjects was < Rs. 10000, 30 per cent subjects had >Rs. 10000-<15000 and 60 per cent subjects had >Rs.15000 to 20000 per month in control group.

The blood pressure was found since less than years in 60 per cent subjects and since more than 5-10 years in 40 per cent in experimental group, whereas it was since less than 5 years in 50 per cent and since more than 5 -10 years in 50 per cent subjects in control group.

In an experimental group 33.33 per cent and in

Nutrient	Amount/100 g
Energy	247 Kcal
Carbohydrates	50.59 g
Protein	3.99 g
Total Fat	1.24 g
Cholesterol	0 mg
Dietary Fibre	53.1 g
Vitamins	
Folates	6 µg
Niacin	1.332 mg
Pantothenic acid	0.358 mg
Pyridoxine	0.158 mg
Riboflavin	0.041 mg
Thiamin	0.022 mg
Vitamin A	295 IU
Vitamin C	3.8 mg
Vitamin E	10.44 mg
Vitamin K	31.2 µg
Electrolyte	
Sodium	10 mg
Potassium	431 mg
Minerals	
Calcium	1002 mg
Copper	0.339 mg
Iron	8.32 mg
Magnesium	60 mg
Manganese	17.466 mg
Phosphorus	64 mg
Zinc	1.83 mg
Zinc	
Phyto-nutrients	
Carotene-β	112 µg
Crypto-xanthin- β	129 µg
Lutein-zeaxanthin	222 µg
Lycopene	15 µg
Cinnamaldehyde	45.13 µg

Source: USDA National Nutrient database

control group 26.66 subjects were having blood pressure in their heredity The habit of eating of pan *supari*, chewing *gutka*, drinking alcohol and smoking was not seen in both the groups. All the subjects suffering from hypertension were taking the medicines allopathic only.

Comparison of systolic and diastolic blood pressure of hypertensive subjects by supplementation with garlic and cinnamon is presented in Fig. 1 and 2. Initially the systolic blood pressure readings were up to 164 mm Hg

Table 3 : Information regarding social economic status and health status of selected hypertensive subjects (n=60)

Sr. No.	Attributes	Distribution of hypertensive subjects			
		Experimental group		Control group	
1.	Age in yrs				
	40 – 60	15	50	16	53.33
	61 – 80	15	50	14	46.66
2.	Sex				
	Male	10	33.3	7	23.33
	Female	20	66.6	23	76.66
3.	Type of family				
	Nuclear	16	53.33	9	30
	Joint	14	46.66	21	70
4.	Education level				
	Illiterate	6	20	8	26.66
	School education	10	33.33	13	43.33
	College education	14	46.66	9	30
5.	Occupation				
	Home maker	10	33.33	9	30
	Service	8	26.66	9	30
	Business	12	40	12	40
6.	Income of family				
	Rs. < 10000	4	13.33	3	10
	Rs. 10000- < 15000	8	26.66	9	30
	Rs. > 15000 - 20000	18	60	18	60
7.	Duration of hypertension				
	Less than 5 years	18	60	15	50
	More than 5 – 10years	12	40	15	50
8.	Heredity				
	Yes	10	33.33	8	26.66
	No	20	66.66	22	73.33
9.	Habit				
	Eating pan <i>supari</i>	Nil	Nil	Nil	Nil
	Chewing <i>gutka</i>	Nil	Nil	Nil	Nil
	Drinking alcohol	Nil	Nil	Nil	Nil
	Smoking	Nil	Nil	Nil	Nil
10.	Kind of medicine using				
	Allopathic	30	100	30	100
	<i>Ayurvedic</i>	Nil	Nil	Nil	Nil
	Allopathic and <i>Ayurvedic</i>	Nil	Nil	Nil	Nil

and diastolic readings were up to 90 mm Hg. After giving the cinnamon and garlic powder supplementation the blood pressure readings were decreasing slowly. Supplementation of cinnamon and garlic continuously for sixty days brought the blood pressure reading as 120 mm Hg for systolic and 80 mm Hg for diastolic.

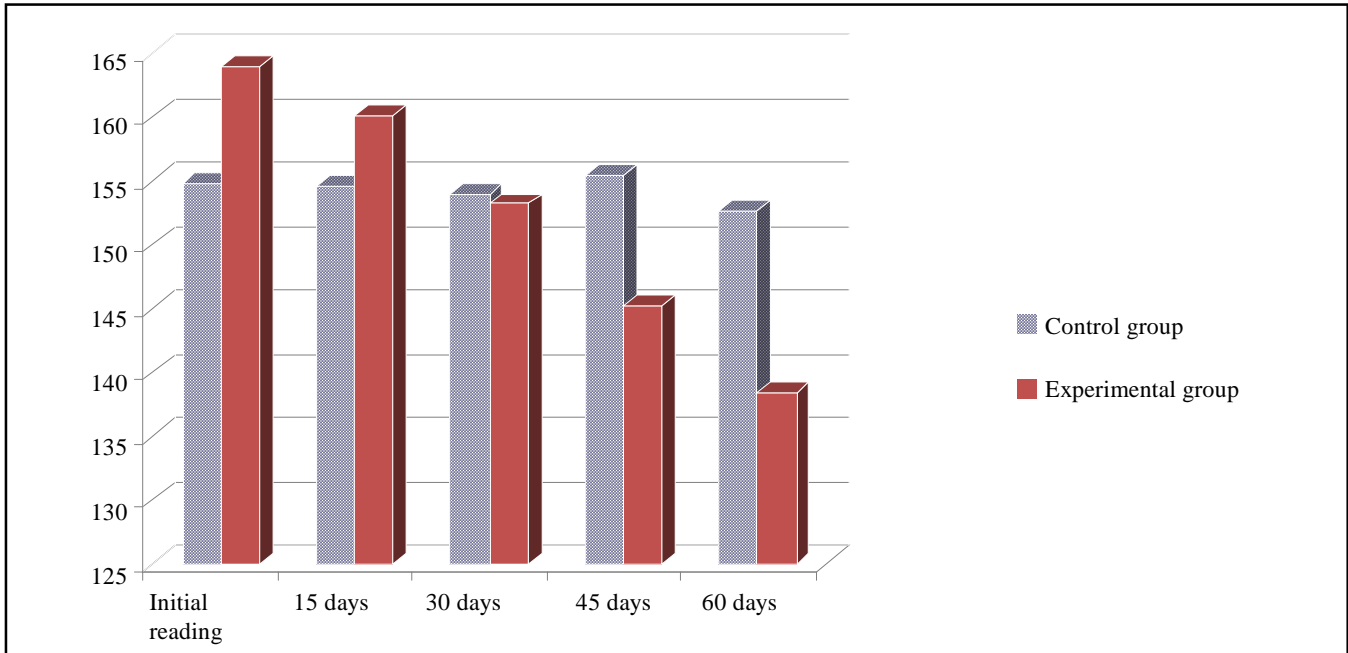


Fig. 1 : Comparison of systolic blood pressure of hypertensive subjects by supplementation of garlic and cinnamon powders

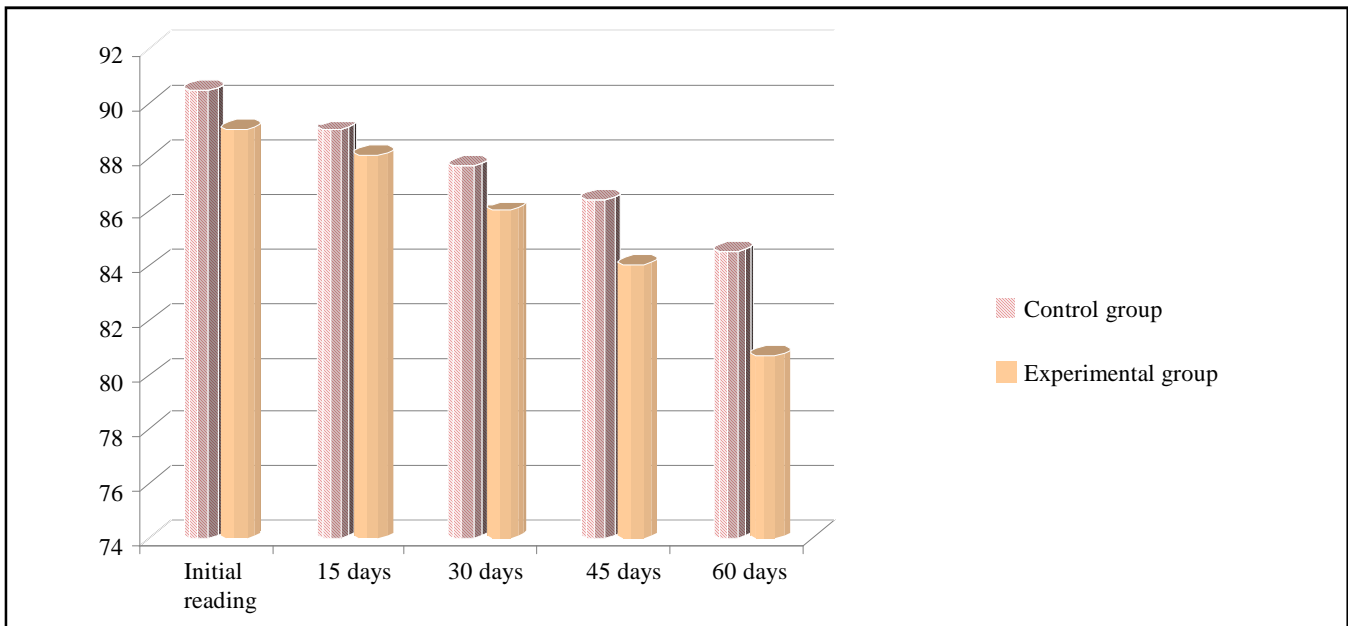


Fig. 2 : Comparison of diastolic blood pressure of hypertensive subject by supplementation of garlic and cinnamon powders

Comparison of supplementation with garlic chutney and supplementation with garlic and cinnamon is shown in Fig. 3 and 4. Supplementation with garlic and cinnamon has positive effect than only with garlic supplementation.

Conclusion:

It is concluded from the study that consumption of 0.5g of dried garlic powder and 0.5 g of cinnamon powder continuously for 60 days found to reduce systolic and diastolic blood pressure. Consumption of garlic and cinnamon has significantly positive effect than only

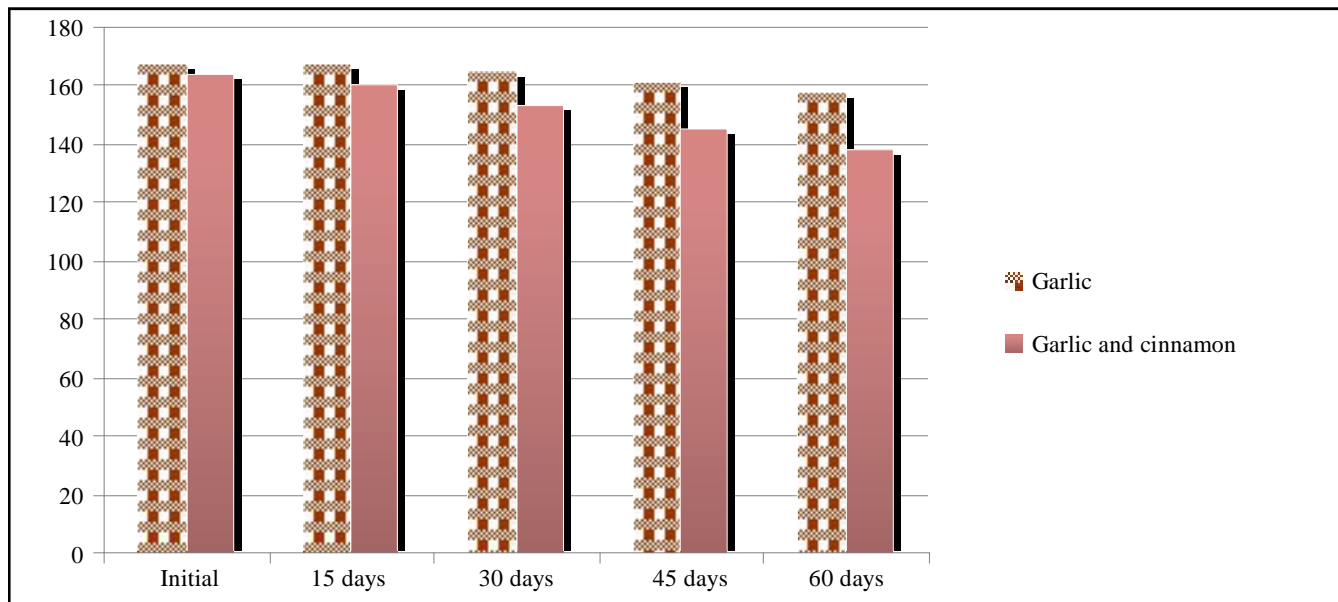


Fig. 3 : Comparison of systolic blood pressure of hypertensive subjects by supplementation of garlic chutney and garlic and cinnamon powders

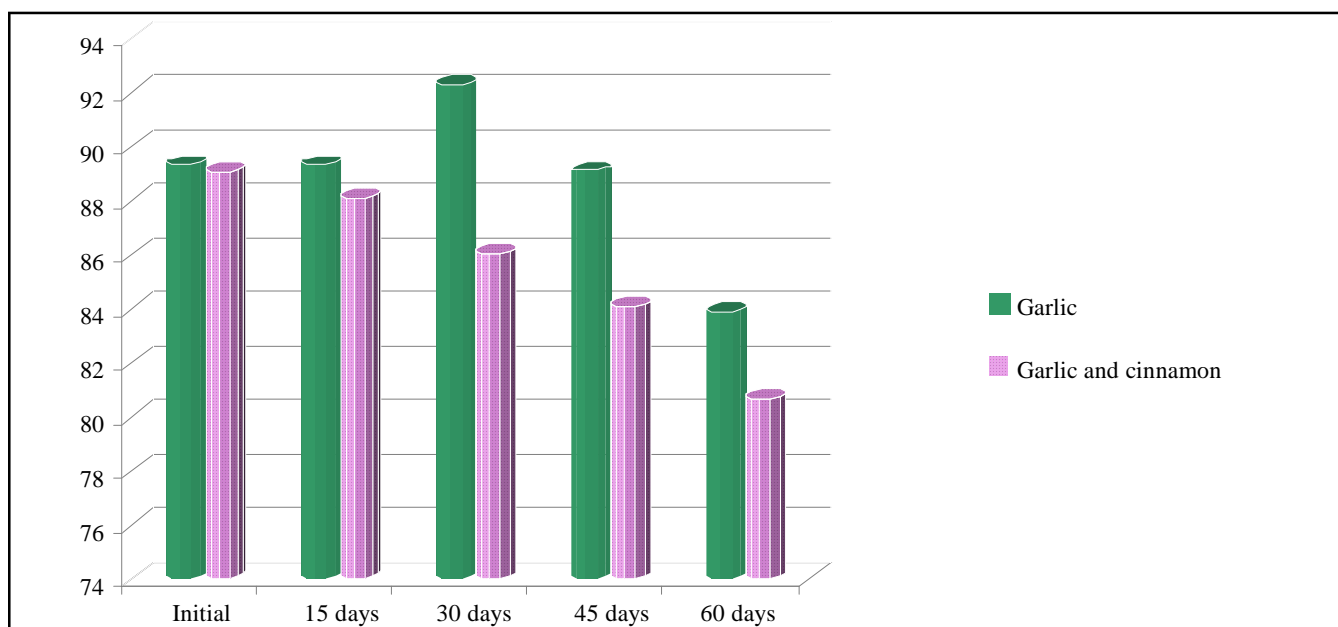


Fig. 4 : Comparison of diastolic blood pressure of hypertensive subjects by supplementation of garlic chutney and garlic and cinnamon powders

consumption of garlic.

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