

Original Article

Effect of Decoction of *Camellia Sinensis* on Blood Pressure and Heart Rate

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ABSTRACT

Objective: *Camellia sinensis* as a tea (hot decoction) is so widely used throughout the Asia. Therefore to find out, their effects on all the body functions are the need of hour. In the current study the effect of *Camellia sinensis* on human (females) blood pressure has been evaluated.

Study Design: Observational study.

Place of Study: This study was conducted at Pharmacy Department, University of Malakand.

Materials and Methods: The blood pressure before and after giving the decoction of *Camellia sinensis* to seventy six individuals was evaluated by using sphygmomanometer and stethoscope.

Results: A moderate increase in the blood pressure had been noted. Also a great decrease in the heart rate of individuals has been identified after taking the decoction.

Conclusion: From the current study it can be concluded that green tea have an effect of increasing blood pressure in the females, so the heart patients have to take care while using green tea in excess quantity.

Key words: *Camellia sinensis*, Decoction, Blood pressure, Heart rate

INTRODUCTION

Nature has been a source of medicinal agents and a large number of drugs are isolated from natural sources. Medicinal plants have a great value in the field of health. From the very past the use of herbal medicine have been very important, and fulfills the primary health care needs of about 80% of the world population¹.

The leaves of *Camellia sinensis* is used as green tea, which have undergone minimal oxidation during processing. Green tea originates from China² and has become associated with many cultures in Asia. According to a survey released by the United States Department of Agriculture in 2007³, the mean content of flavonoids in a cup of green tea is higher than that in the same volume of other food and drink items that are traditionally considered of health contributing nature, including fresh fruits, vegetable juices or wine. Flavonoids are a group of phytochemicals in most plant products that are responsible for such health effects as anti-oxidative and anticarcinogenic functions³.

Green tea contains salubrious polyphenols, particularly catechins, the most abundant of which is epigallocatechin gallate, carotenoids, tocopherols, ascorbic acid (vitamin C) minerals such as chromium, manganese, selenium or zinc, and certain phytochemical compounds. It is a more potent antioxidant than black tea⁴. Types of tea are commonly

graded depending on the quality, parts of the plant used and how they are processed⁵. After water, tea is the most widely consumed beverage in the world⁶. In a study of the eating habits of 2,018 women, consumption of mushrooms and green tea was linked to a 90% lower occurrence of breast cancer⁷. The green tea extract may play a role in the control of body composition via sympathetic activation of thermogenesis, fat oxidation, or both⁸. It has also been presented that epigallocatechin-3-gallate (a component of green tea) can be used in prevention or treatment of inflammatory processes⁹. However, pharmacological and toxicological evidence does indicate that green tea polyphenols can in fact cause oxidative stress and liver toxicity¹⁰. Other evidence presented in the review cautions against the drinking of green tea by pregnant women¹¹. It "suggested that the oral intake of L-Theanine (a chemical found in green tea) could cause anti-stress effects via the inhibition of cortical neuron excitation¹². Daily consumption of tea containing 690 mg catechins for 12 wk reduced body fat, may be useful in obesity¹³. Green tea also has a role in the treatment and prevention of cancer¹⁴ and to treat multiple sclerosis¹⁵.

As *Camellia sinensis* is mostly used as a tea in the form of hot decoction, throughout the Asia. Therefore the current study was designed with a view to confirm and explore the effects of green tea on the blood pressure according to gender. Whether it is beneficial for high

blood pressure in females or it may lead to high blood pressure, to stop drinking by volunteers' have routine high blood pressure.

MATERIALS AND METHODS

Plant Material

The fresh dried and processed leaves of *Camellia sinensis* plant were purchased from local market Abbottabad, Pakistan. The specimen pack, marked with a number 1320 has been deposited in Pharmacy Museum, University of Malakand Pakistan.

Preparation of Decoction

Each sachet contained 02 grams of dried plant material were soaked in each cup of 150ml boiling water for three minutes. 10 grams of sugar were added as a sweetening agent to each cup.

Experimental protocol

The basis for this investigation was blood pressure and heart rate of 3rd year students of Frontier medical College Abbottabad Pakistan. Subjects were selected on the basis of four primary criteria. These include age, sex, health and Physical body status. The research specifically targets individuals between 21 and 23 years of age. Seventy six female students, who fulfilled the above criteria, were selected for the study. They were first provided a thorough explanation of the research effort, its benefits and the potential risks to subjects.

Blood pressure and heart rate were noted in all the volunteers by using aneroid sphygmomanometer with stethoscope before and after the drinking of one cup of decoction. I.e. Before, at 0min and after 30 & 60 minutes of taking the decoction. Cumulative results were calculated by using formula;

Cumulative (systolic/ diastolic/ Heart rate) =

$$\frac{\text{Sum of all systolic / diastolic / heart rate}}{\text{total number}(76)}$$

RESULTS

A total seventy six individual were selected in the current study, and a cumulative result was shown in table 1.

Table.No.1: cumulative result of eighteen female subjects for B.P & HR

Sex	Timing	Systolic Blood Pressure	Diastolic Blood Pressure	Heart Rate
Female	Initial Reading	105 mmHg	68_mmHg	75/min
	After 30 minutes	107 mmHg	69_mmHg	71/min
	After 60 minutes	114 mmHg	72_mmHg	60/min

A decrease in the heart rate was observed as; in the first half hour a little decrease in the heart rate had been noted, while in the next half hour a great decrease in the heart rate had been observed. From this it has been confirmed that *Camellia sinensis* has a strong effect on heart rate, i.e. it decreases the heart rate in normotensive female individuals. It was also noted a little increase in the systolic blood pressure in the first half hour which further increased in the next half hour. As far as the diastolic blood pressure is concerned, the decoction of *Camellia sinensis* was found to have a little increase in the diastolic blood pressure too.

DISCUSSION

The current study reveals that, drinking of Green tea by the females individuals may have a high risk of increase blood pressure. For each heartbeat, BP varies between systolic and diastolic pressures. Systolic pressure is peak pressure in the arteries, which occurs near the end of the cardiac cycle, when the ventricles are contracting. Diastolic pressure is minimum pressure in the arteries, which occurs near the beginning of the cardiac cycle when the ventricles are filled with blood. An example of normal measured values for a resting, healthy adult human is 120 mmHg systolic and 80 mmHg diastolic.

As Hodgson et al¹⁶ reported that drinking of green tea leads to acute increase in systolic and diastolic blood pressure at 30 min after drinking. Same result was noted in the current study, but no significant increase were noted at 30 minutes but after 60 minutes more significant increase in the systolic blood pressure were recorded. And also a notable increase in the diastolic blood pressure was confirmed, may be dependant on gender.

Seifert et al¹⁷ reported that, Green tea extract in a short-term dosing schedule similar to that commonly used with dietary supplements did not result in alterations in heart rate or blood pressure, while in the current study it was found that each cup of green tea have a significant increase in systolic and minor increase in diastolic blood pressure. Also a great fall in heart rate had been noted i.e. from 75 heart beat to 60 heart beat. So it is recommended for heart patients to take care of drinking green tea.

There is some evidence suggesting that regular green tea drinkers have lower chances of heart disease¹⁸ and of developing certain types of cancer¹⁹. Although green tea does not raise the metabolic rate enough to produce immediate weight loss, a green tea extract containing polyphenols and caffeine has been shown to induce thermo genesis and stimulate fat oxidation, boosting the metabolic rate 4% without increasing the heart rate⁸. Same was the finding that it couldn't increase heart rate but we can say that it decreases the heart rate.

CONCLUSION

From the current study it can be concluded that, Green tea have an effect of increasing blood pressure in the females, so the heart patients who have proven to high blood pressure must, have to take care while using green tea in excess quantity.

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