

Effect of Green tea on Heart Rate of Male and Female

¹Naveed Ullah, ¹Mir Azam Khan, ²Afzal Haq Asif, ²Afrasiab Ali Shah, ²Sadaf Anwar, ²Hazrat Wahid and ³Aamir Nazir

¹Department of Pharmacy, University of Malakand Chakdara, Pakistan

²Department of Pharmacology, Frontier Medical College Abbottabad, Pakistan

³Department of Physiology, Ayub Teaching Hospital Abbottabad, Pakistan

Abstract: *Camellia sinensis* (Green tea) as a hot decoction is widely used throughout the Asia. Therefore to find out their effects on all the body functions are the need of hour, to recommend its safe use. In the current study the effect of *Camellia sinensis* on human (male and females) heart rate has been studied, by giving one cup of hot decoction of green tea to each subject of fifty four male and fifty four females. The heart rate per minute before and after the decoction was evaluated as; a great increase in the heart rate had been noted in case of males. Also a great decrease in the heart rate of individuals has been identified in case of females. From the current study it can be concluded that green tea have an effect of increasing heart rate in males and decreasing in the females, so the heart patients have to take care while using green tea.

Key words: *Camellia sinensis*, decoction, heart rate, males and females

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 population (WHO, 2001).

The leaves of *Camellia sinensis* is used as green tea, which have undergone minimal oxidation during processing. Green tea originates from China (The Tea Guardian, 2010b) and has become associated with many cultures in Asia. According to a survey released by the United States Department of Agriculture in 2007 (USDA Database, 2007), 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 functions (USDA Database, 2007).

Green tea contains salubrious polyphenols, particularly catechins, the most abundant of which is epigallocatechin gallate. Green tea also contains 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 tea (Cabrera *et al.*, 2006).

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 heart rate according to the gender. Whether it is beneficial for males and females according to heart rate or it may lead tachycardia or bradycardia, to stop drinking by volunteers' have heart problems.

MATERIALS AND METHODS

Plant material: The fresh dried leaves of *Camellia sinensis* plant were purchased from local market Abbottabad, Pakistan in March 2011. The study was performed in the Pharmacology and Therapeutics Laboratory, Frontier Medical College Abbottabad Pakistan. The specimen pack, marked with a number 1222 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 150 mL boiling water for three minutes. 10 g of sugar were added as a sweetening agent to each cup.

Experimental protocol: The basis for this investigation was heart rate of 3rd and 4th year students of Frontier medical College Abbottabad Pakistan. Subjects were selected on the basis of four primary criteria. These

Table 1: Cumulative result of fifty four male and fifty four female subjects

Gender	Initial heart rate	After 30 min	After 60 min
Male	75/min	77/min	85/min
Female	75/min	71/min	60/min

include age, sex, health and Physical body status. The research specifically targets individuals between 21 and 23 years of age. Fifty four male and fifty four 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.

Heart rate was noted in all the volunteers by using stethoscope before and after the drinking of one cup of decoction, i.e. before, at 0 min and after 30 and 60 min of taking the decoction. Cumulative results were calculated by using formula;

$$\text{Cumulative Heart Rate} = (\text{Sum of heart rate}/\text{total number})$$

RESULTS AND DISCUSSION

A total one hundred and eight individual were selected in the current study, and a cumulative result was shown in Table 1. A great increase in the heart rate was observed in the case of males as; in the first half hour a mild increase in the heart rate had been noted, while in the next half hour a great increase in the heart rate had been observed. While in the case of females a little decrease in the heart rate were noted after half an hour of taking the tea. Further in the next half hour a great decrease were measured. From this it can be concluded that *Camellia sinensis* has a strong effect on heart rate, i.e., it decreases the heart rate in normotensive female individuals and increases heart rate in the normotensive male individuals. An Australian-led international study of patients with cardiovascular disease has shown that heart beat rate is a key indicator for the risk of heart attack. The study, published in The Lancet (September 2008) studied 11,000 people, across 33 countries, who were being treated for heart problems. Those patients whose heart rate was above 70 beats per minute had significantly higher incidence of heart attacks, hospital admissions and the need for surgery. University of Sydney professor of cardiology Ben Freedman from Sydney's Concord hospital said "If you have a high heart rate there was an increase in heart attack, there was about a 46 percent increase in hospitalizations for non-fatal or fatal heart attack (Heart Beat an Indicator of Disease Risk, 2008).

Seifert *et al.* (2011) 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 while in the current study it was found that

each cup of green tea have a significant increase of heart rate in males and decrease of heart rate in females. 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 disease (The Tea Guardian, 2010a) and of developing certain types of cancer (Green Tea's Cancer-Fighting, 2003). 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 rate (Dulloo *et al.*, 1999). Same was the finding for females that it couldn't increase heart rate but decreases the heart rate, while in males it increases the heart rate. And it would need further study to find out at which mechanism the heart rate increase and decrease in either sex.

CONCLUSION

From the current study it can be concluded that *Camellia sinensis* has a strong effect on heart rate, i.e. it decreases the heart rate in normotensive female individuals and increases the heart rate in the normotensive male individuals. So the heart patients have B.P problems, must have to take care while using the decoction in excess quantity as the case may be.

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