Original Article

Effect of Lemon Grass and Green Tea on Blood Pressure and Heart Rate

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ABSTRACT

Objective: Lemon grass and Green tea are the herbal products, widely used, next to that of water. Because of their common use, it is so much necessary to find their effects on all the body functions. In the current study its effects of blood pressure and heart rate of human male has been evaluated.
Study Design: Observational study.
Place of Study: This study was conducted at Pharmacy Department, University of Malakand.
Materials and Methods: Seventy two male volunteers for each tea had been selected and the blood pressure before and after giving one cup of each tea to each individual was evaluated by using sphygmomanometer and stethoscope.
Results: A minor increase in blood pressure was noted in the volunteers taken green tea. On other hand a moderate decrease in the systolic blood pressure and mild increase in the diastolic blood pressure were noted in the case of lemon grass. Also, great decreases in the heart rate of individuals taken lemon grass, and a moderate increase in the heart rate of individuals taken green tea were observed.
Conclusion: From the current study it can be concluded that the Male heart patients are on the high risk to the use of either type of tea, so they have to take care while using either type of tea in excess quantity.
Keywords: Lemon grass, Green tea, Blood pressure, Heart rate.

INTRODUCTION

Cymbopogon citratus (Lemon grass) is an aromatic perennial tall grass with rhizomes and densely tufted fibrous root. As a medicinal plant, lemon grass has been considered a carminative and insect repellant. Studies on extracts from Cymbopogon citrates leaves have demonstrated anti-inflammatory, vaso-relaxing, diuretic and valuable remedy in treating ringworm as local application. Lemongrass oil was claimed to have anti-helmintic activity[1].

Lemongrass oil is used as a pesticide and a preservative. Research shows that lemongrass oil has anti-fungal properties[2]. Cymbopogon citratus is consumed as a tea for anxiety in Brazilian folk medicine[3], but a study in humans found no effect[4]. The tea caused a recurrence of contact dermatitis in one case[5]. The researchers observed that citral induces programmed cell death in the cancerous cells, while the normal cells were left unharmed[6].

The leaves of Camellia sinensis is used as green tea, which have undergone minimal oxidation during processing. Green tea originates from China[7] and has become associated with many cultures in Asia. According to a survey released by the United States Department of Agriculture in 2007[8], 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. Flavonoids are a group of phytochemicals in most plant products that are responsible for such health effects as anti-oxidative and anticarcinogenic functions[8]. Green tea contains salubrious polyphenols, particularly catechins and has more potent antioxidant than black tea[9]. Types of tea are commonly graded depending on the quality, parts of the plant used and how they are processed[10]. After water, tea is the most widely consumed beverage in the world[11]. 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 cancer[12]. The green tea extract may play a role in the control of body composition via sympathetic activation of thermogenesis, fat oxidation, or both[13]. It has also been presented that epigallocatechin-3-gallate (a component of green tea) can be used in prevention or treatment of inflammatory processes[14]. However, pharmacological and toxicological evidence does indicate that green tea polyphenols can in fact cause oxidative stress and liver toxicity[15]. Other evidence presented in the review cautions against the drinking of green tea by pregnant women[16]. 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 excitation[17]. Daily consumption of tea containing 690 mg catechins for 12 wk reduced body fat, may be useful in obesity[18]. Green tea also has a role in the treatment and prevention of cancer[19] and to treat multiple sclerosis[20].

As Lemon grass and Green tea is widely used throughout the Asia. Therefore the current study was designed with a view to confirm and explore the effects of these plants materials on the blood pressure and heart rate, whether the decoction of these plants i.e. tea are beneficial for high blood pressure 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 leaves of Cymbopogon citratus and Camellia sinensis were purchased from local market Abbottabad, Pakistan. The specimen packs was marked with number 1622 and deposited in the Pharmacy Museum University of Malakand, Pakistan.

Preparation of Decoction

02 grams of dried plant material for each subject were weighed and soaked in 150 ml (cup) of boiling water for 03 minutes. 10 grams of sugar were added as a sweetening agent in each cup.

Experimental protocol

The basis for this investigation was blood pressure and heart rate of 3rd year and 4th year male 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. One hundred and forty-four male students (seventy-two for each tea), 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 each tea. 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) =

$$\frac{Sum\ of\ all\ systolic\ /\ diastolic\ /\ heart\ rate}{total\ number\ (72)}$$

RESULTS

A total seventy two individuals for each tea were selected in the current study, and a cumulative result was shown in table 1. An acute decrease in the heart rate was observed after taking a cup of hot decoction of lemongrass tea. In the first half hour a maximum decrease had been noted, while in the next half hour no further significant decrease had been observed. From this it can be concluded that Cymbopogon citratus has an effect on heart rate, i.e. it quickly decreases the heart rate in normotensive individuals. A decrease in the systolic blood pressure was also noted, while a minor increase in the diastolic blood pressure was also found. Form this it can be concluded that, drinking of Cymbopogon citrates as a tea by the males may have risk of bradycardia.

In the case of Camellia sinensis a great increase in the heart rate was observed as; in the first half hour a little increase in the heart rate, but in the next half hour a great increase in the heart rate had been noted. From this it can be concluded that Camellia sinensis has a strong effect on heart rate, i.e. it increases the heart rate in normotensive male individuals opposite to that of lemon grass, which decreases the heart rate. It was also noted a minor increase in the systolic and diastolic blood pressure.

Table.No.1: Cumulative result of seventy two male subjects for each tea

Decoction	Timing	Systolic Blood Pressure	Diastolic Blood Pressure	Heart Rate
Lemon grass	Initial Reading	115 mmHg	74 mmHg	81/min
	After 30 minutes	108 mmHg	75 mmHg	65/min
	After 60 minutes	103 mmHg	78 mmHg	63/min
Green tea	Initial Reading	120 mmHg	80 mmHg	75/min
	After 30 minutes	121 mmHg	80 mmHg	77/min
	After 60 minutes	124 mmHg	84 mmHg	85/min

DISCUSSION

As Carbajal et al[21] reported that Cymbopogon citratus leaves have dose related hypotensive effects in rats. But the current study was performed in human (male) revealed that the decoction of Cymbopogon citratus has a moderate decrease in systolic and minor increase in diastolic blood pressure effects.

Gazola et al[22] reported an in-vitro study of aqueous extract of Cymbopogon citrates, showed a significant decrease in the heart rate of rats. Same was the outcomes of the current study (in-vivo) as; effect of Cymbopogon citratus oral decoction on human (male) was found a significant decrease in the heart rate.

Anigbogu, C.N and Olayeni[23] reported that *Cymbopogon citratus* has a little or no effect on blood pressure except in high doses, and also have no effect on heart rate, but in the current study a great decrease in the heart rate was noted.

According to Hodgson et al[24], Drinking of green tea leads to acute increase in systolic and diastolic blood pressure at 30 min after drinking. But in the current study, no significant increase was noted at 30 minutes but minor increase was noted after 60 minutes.

Seifert et al[25] 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 minor increase in systolic and diastolic blood pressure. Also a great increase in heart rate had been noted unlike lemon grass. So it is recommended for heart patients to take care of drinking green tea and lemon grass.

CONCLUSION

From the current study it can be concluded that, excess drinking of Lemon grass tea by the males may have risk of bradycardia, while Green tea were found to increase the heart rate in normotensive male individuals i.e. opposite to that of lemon grass.

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