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CAMELLIA SINENSIS -EFFECTS ON PEFR ON HEALTHY COLLEGE STUDENTS -A GENERAL STUDY

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ABSTRACT

The herbs are being used from centuries for remedies from common ailments to potential diseases. The commonly used plant products like turmeric, cinnamon, clove. have different pharmacological effects. While Rauwoifia serpentina is the first and oldest herb to have anti hypertensive and as remedy for Schizophrenia. Though it is being used still in ayurveda but its use in allopathy is greatly limited because of suicidal tendency as side effect. *In current studies we did research on Green Tea (Camellia sinensis) for its effects on PEFR.* Green tea contains alkaloids on an average, 3% to 4% of caffeine and very small amounts of other alkaloids known as methylxanthines, such as caffeine, theobromine and theophylline, having proven bronchodilator effects along with, L–theanine. Graham[1] found that fresh leaves of Green tea contains polyphenols and catechins which are antioxidant and have number of other beneficial effects like anti-aging, blood glucose lowering and even anti cancerous effect *We have selected healthy college students both male and female for current study to show effect of green tea on* Peak Expiratory Flow Rate (PEFR). This is very important physiological parameter effecting our body and moreover with increasing number people including young children and adults becoming asthmatic and intolerant to present pollution levels the PEFR – parameter is selected to ascertain their lung functioning, which directly shows lungs capacity.

KEYWORDS: Green tea, camellia sinensis, PEFR, catechins.

BACKGROUND

Herbal[2] drugs constitute a major share of all the officially recognized systems of health in India *viz*. Ayurveda, Yoga, Unani, Siddha, Homeopathy and Naturopathy, except Allopathy. More than 70% of India's 1.2 billion populations still use these non-allopathic systems of

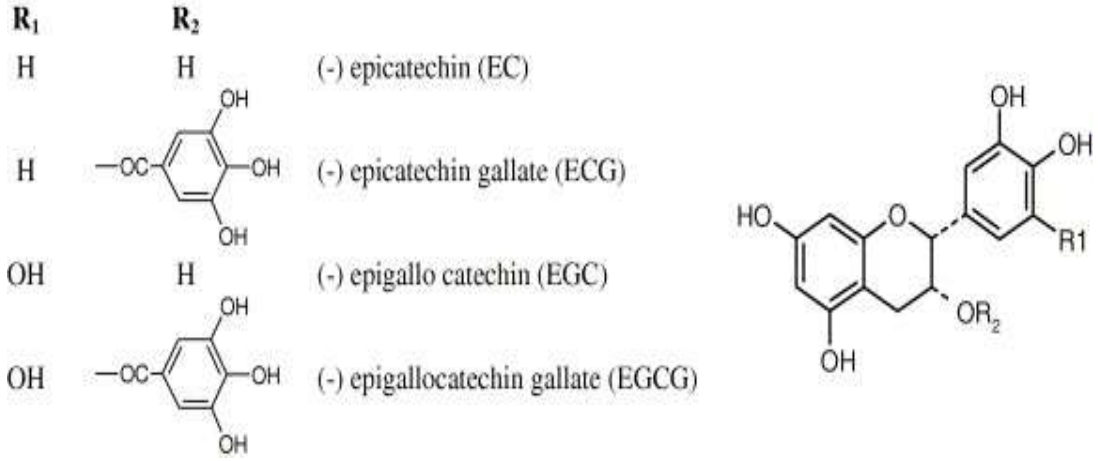
medicine. Currently, there is no separate category of herbal drugs or dietary supplements, as per the Indian Drugs Act. However, there is a vast experiential-evidence base for many of the natural drugs. This offers immense opportunities for Observational Therapeutics and Reverse Pharmacology. Evidence-based herbals are widely used in the diverse systems and manufactured, as per the pharmacopoeial guidelines, by a well-organised industry. Significant basic and clinical research has been carried out on them.

The popularity of herbs have increased because of side effects of synthetic drugs, development of resistance to many drugs like antibiotics, public awareness, population explosion, insufficient supply of drugs, high cost of synthetic drugs. Scientifically speaking and more precisely pharmacologically speaking their metabolism and excretion is also as of natural substances with no burden on our systems including kidneys.

Indian literature mentions the use of plants in treatment of various human ailments. India has about 80% of the world's population which relies solely or largely on traditional remedies for their healthcare needs. Today, about 70,000 to 80,000 plant species are used for medicinal or aromatic purposes globally. India with its ecological, geographical and climatic diversities is perhaps the richest nation with a vast herbal medicinal wealth (About 15000-20000 plants have good medicinal value). In India the therapeutic use of herbs dates back to the vedic period. The Rigveda has documented about 67 medicinal plants, Yajurveda 81 species and Atharvaveda 290 species.

Chemical Composition and Constituents of Green tea

The most important green tea ingredients are catechins, theanine and caffeine.



Green tea ingredients are extremely complex. It contains as many as 200 bioactive compounds.

Not only are they complex, being plant material, their levels also extremely variable and change with location, harvesting season and making process.

The largest and most important chemical compound is polyphenols are very important because they contain flavonoids - an important class of antioxidants. To keep this in view tea from Sri Lanka is imported which is of very fine quality and as such we further want to emphasize that as a food habits, we Asians drink green tea while French people drink red wine and spain is predominant with olive oil use which provide various Cardio vascular protective effects. The *beneficial effects of wine can be traced back to the dawn of human civilization. It is a global socioreligious symbol associated with a multitude of therapeutic benefits, including medicinal as well* as magical powers. The current popular propositions about the benefits of 'moderate wine drinking' in fact date back through history and were first proposed by the Father of Medicine, Hippocrates of Kos, in Greece. However, the cardiovascular benefits of red wine became the hub of research activity after the observation of 'French paradox' by Renaud and de *Lorgeril*[3] who, in 1992, found that there was a low mortality rate from ischemic heart disease among French people despite their high consumption of saturated fats and the prevalence of other risk factors, such as smoking. This was attributed to their so-called 'Mediterranean diet', which includes a large intake of wine. In 1997, a Dutch epidemiological study[4] showed that coronary artery disease in elderly men is inversely proportional to their flavonoids intake of green tea catechins and their biological actions. There are also human studies on using green tea catechins to treat metabolic syndrome, such as obesity, type II diabetes and cardiovascular risk factors.

Similarly in current studies Green Tea (Camellia sinensis) which is procured from Sri lanka (Hyson) is one fine quality green tea. As we know the tea contains active ingredients like catechins having anti-oxidative properties. In the green tea extract are catechins (GTC), which comprise four major epicatechin derivatives; namely, epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG) and epigallocatechingallate (EGCG). e Catechins and epigallocatechin which are having good are potent anti-oxidants and free radical quenchers. By virtue of their these properties they are very good for skin, have anti aging property but good for increasing insulin sensitivity and reduces blood sugar levels probability with this mechanism they work. As it is part of our routine life the subjects are

given weighed and boiled to give 100 ml of final green tea to be consumed, for 0 -7 days day for instant effects.

The nutritional value of green tea is very high – the most vital of all ingredients is the antioxidant known as polyphenol. Green tea is rich in catechin polyphenols.

Catechins are the major group of polyphenols in green tea and the most active catechins are called epigallocatechin-3-gallate (EGCG). Other catheins compounds are: catechin, gallaogatechin (GC), epicatehcin (EC), epigallocatechin (EGC), epicatechingallate (ECg). EGCG is a powerful antioxidant that helps in slowing down the aging process.

According to research and extensive studies, EGCG has the highest level and broadest spectrum of cancer-fighting activity. Many scientists now agree that polyphenols can actually prevent the growth of cancer cells and kills cancer cells without any harm to the healthy tissues.

Antioxidants can neutralize free radicals before they can cause any damage. They help to facilitate digestion and metabolism in the body. Antioxidants act as a cleaning mechanism in the blood and that is great for cardiovascular health.

Evidence suggests that green tea provide other health benefits such as lowering blood pressure, reducing LDL cholesterol and even fighting oral bacteria that causes plaque. So this tea is good for the reduction or elimination of tooth decay.

The PEFR studies however are done on 0-7 days only. To ascertain the high level of pollution in NCR i.e Delhi and surrounding area is aim of this study. We included healthy individuals without Bronchitis, Asthma or COPD for our current study. As all volunteers are belonging to healthcare profession and it is part of their routine practical part in their curriculum; we have just made supervision and made an ethical committee to tabulate and analyst the result. A signed consent however has been taken from each participant.

The tea is also imported with all phyto clearances and with consent of supplier. The results are interesting and give us insight into that how simple healthy habits give us tremendous health benefits.

Dried leaves of green tea can contain 7% to 14% of other flavonoids compounds.

About two thirds of these flavonoids are flavonols, also powerful antioxidants, they are known to be anti-histamine and anti-inflammatory.

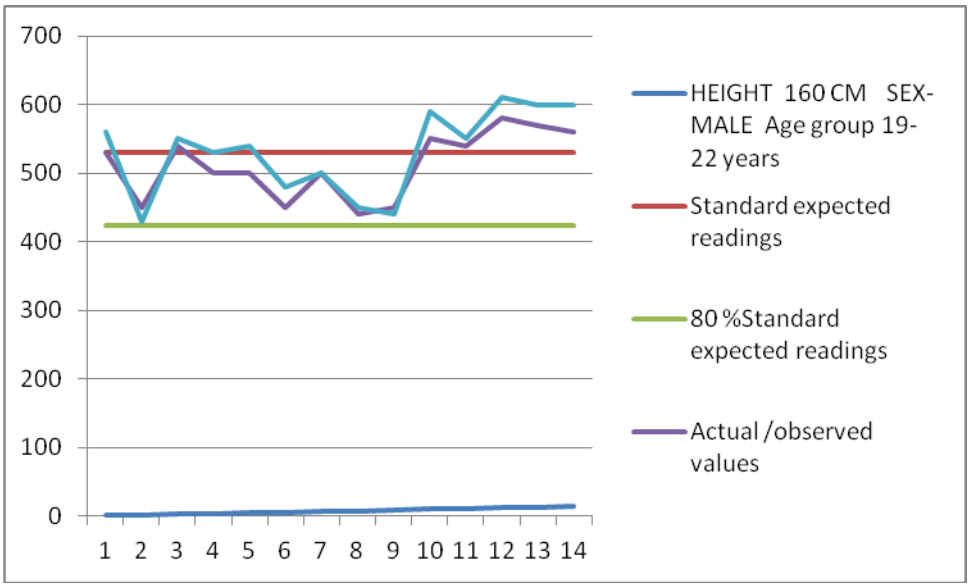
Catechins have been drumming their benefits in recent years. But it is for theanine that tea lovers have yearned for centuries.

OBSERVATIONS

Peak expiratory effects

Table: 1. HEIGHT 160 CM SEX- MALE Age group 19-22 years.

S.N	Standard expected readings	80 %Standard expected readings	Actual /observed values	Actual /observed values after green Tea	% Change	Conclusion
1.	530	424	530	560	5.66	Ok
2.	530	424	450	430	-4.65	80%
3.	530	424	540	550	1.85	Ok
4.	530	424	500	530	6	80%
5.	530	424	500	540	8	Ok
6.	530	424	450	480	6.6	80%
7.	530	424	500	500	nil	80%
8.	530	424	440	450	2.27	80%
9.	530	424	450	440	2.22	80%
10.	530	424	550	590	7.27	Ok
11.	530	424	540	550	1.88	Ok
12	530	424	580	610	5.17	Ok
13	530	424	570	600	5.26	0K
14	530	424	560	600	7.14	OK
15	530	424	590	590	nil	OK



Peak Expiratory flow rate

Table 2. HEIGHT 167 -170 CM CM SEX- MALE Age group 19-22 years.

S.N	Standard expected readings	80% Standard expect reading	Actual /observed values	Actual /observed valuesafter green Tea	% Change	CONCLUSION
1.	570	472	490	510	4.08	80% of standard expected value
2.	570	472	580	600	3.44	Ok
3.	570	472	580	610	5.17	Ok
4.	570	472	590	590	nil	Ok
5.	570	472	430	450	4.65	Low
6.	570	472	450	480	6.66	Low
7.	570	472	550	610	9.09	OK
8.	570	472	540	600	11.11	80%
9.	570	472	530	580	9.43	80%
10.	570	472	550	580	5.45	80%

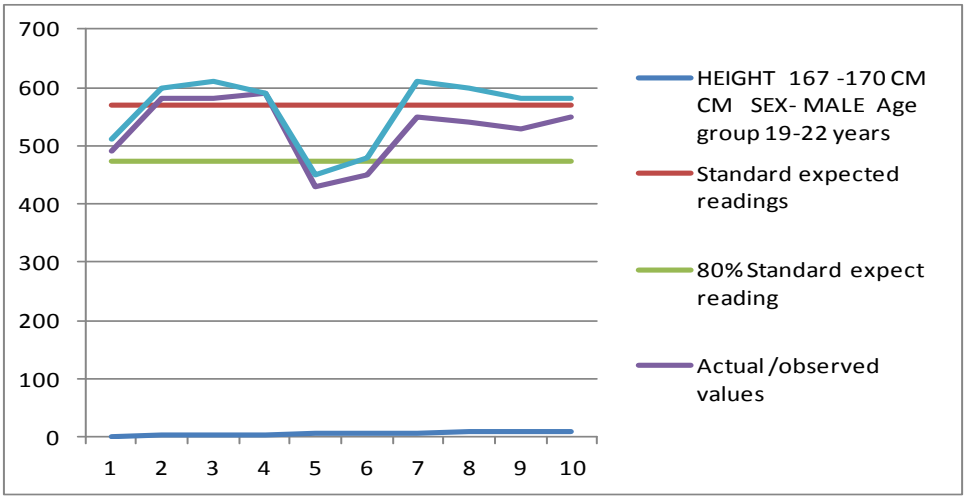
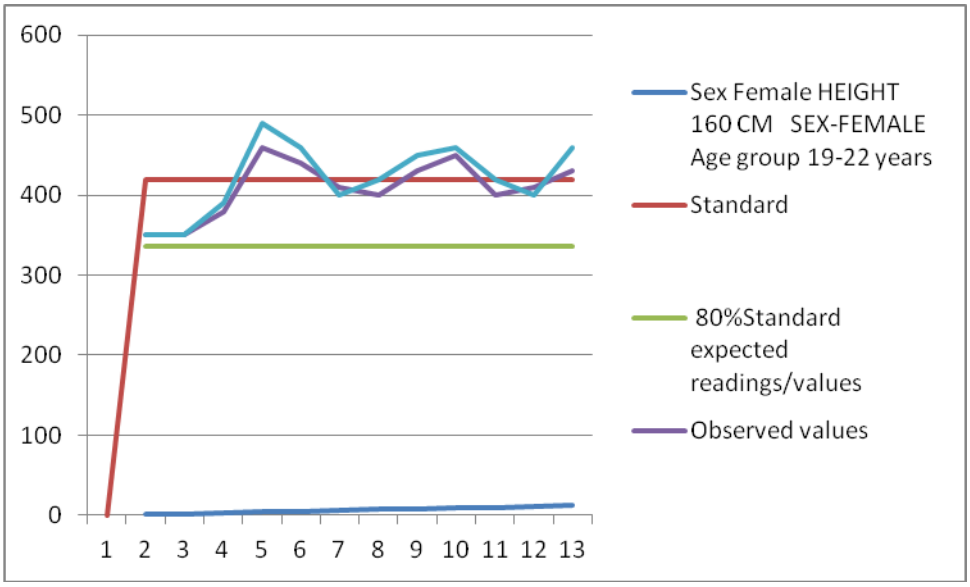


Table 3: Peak Expiratory flow rate Sex Female HEIGHT 160 CM Age group 19-22 years.

S.N	Standard Expected values/readings	80%Standard expected readings/values	Observed values	observed valuesafter green Tea	% change	CONCLUSION
1.	420	336	350	350	nil	80%
2.	420	336	350	350	nil	80%
3.	420	336	380	390	2.63	80%
4.	420	336	460	490	6.52	Above average
5	420	336	440	460	4.54	Above average
6	420	336	410	400	-2.5	80%
7	420	336	400	420	5	80%
8	420	336	430	450	4.65	OK
9	420	336	450	460	2.22	Above average
10	420	336	400	420	5	80%
11	420	336	410	400	-2.43	80%
12	420	336	430	460	6.9	Above average



Peak Flow Rate Measurement

Peak[7] expiratory flow rate (PEFR) is the maximum flow rate generated during a forceful exhalation, starting from full lung inflation. Peak flow rate primarily reflects large airway flow and depends on the voluntary effort and muscular strength of the individual.

Maximal airflow occurs during the effort-dependent portion of the expiratory maneuver, so low values may be caused by a less than maximal effort rather than by airway obstruction. Nevertheless, the ease of measuring peak flow rate with an inexpensive small portable device has made it popular as a means of following the degree of airway obstruction in patients with asthma and other pulmonary conditions.

Forced expiratory volume over 1 second (FEV_1) is a dynamic measure of flow used in formal spirometry. It represents a truer indication of airway obstruction than does peak flow rate. Although peak flow rate usually correlates well with FEV_1, this correlation decreases in patients with asthma as airflow diminishes.

Peak flow rate monitoring can be accurately performed by most patients older than 5 years. It is most commonly measured by a portable flow gauge device but may also be obtained by a transducer that converts flow to electric output during spirometry (pneumotachometer).

Studies[8] using animal models show that green tea catechins provide some protection against degenerative diseases.

The most frequent use of peak flow rate measurement is in home monitoring of asthma, where it can be beneficial in patients for both short and long-term monitoring. When properly performed and interpreted, peak flow rate measurement can provide the patient and the clinician with objective data upon which to base therapeutic decisions.

However, a recent meta-analysis found peak flow rate monitoring to be equivalent to symptom-based asthma action plans. Another study suggested that with symptom-based monitoring, some patients underestimate the severity of their condition and use medication inappropriately.

In 2007, an expert panel of the National Asthma Education and Prevention Program recommended periodic assessment of pulmonary function by spirometry or peak flow rate monitoring. If peak flow rate monitoring is used, a written asthma action plan should use the patient's personal best peak flow, rather than published norms, as a reference value.

The panel recommended consideration of long-term daily peak flow rate monitoring or home peak flow rate assessment during exacerbations for patients with the following:

- Moderate or severe persistent asthma.
- History of severe exacerbations.
- Poor perception of airflow obstruction and worsening asthma
- Preference for peak flow rate monitoring rather than the use of a symptom-based asthma action plan

MATERIAL AND METHODS

Oven, electronic balance, silica gel, TLC plates and chamber, methanol, ethanol, Petroleum ether, dissolution apparatus, Green tea dried leaves, heating mantle, Peak flow meter of EU manufactured by Cipla Human volunteers, A simple blow as depicted in diagram and notingthe reading where marker points make one cycle or one reading. In all three readings has to be taken and highest among them is documented.

Technique of performing PEFR.

The Green was provided for current study by EMPIRE TEAS (PVT) LTD.

Sri Lanka to DR RAVI MALHOTRA, the Principal investigator by DHL courier with PHYTOSANITARY CERTIFICATE NO QC/1A 0520393 DATED 24.08.13.

RESULT AND DISCUSSION

The Green tea in dried leaf form was procured from EMPIRE TEApvt ltd.[9] was given to healthy test subjects both male and females with no previous disease condition with there signed consent, in age group of (19-22years). It is evident from observations that 60% of male tested in age group 19-22 and height 160 cm are ok i.e are having readings as per expected readings while another 40%fall in range of 80% which is minimum expected value. In males with height 170 cm two failed to comply even to 80% value while 40% cleared expected value and another 40% of 80% of expected value. This shows that even young college students do not have very good PEFR values and by considering there age group it is matter of concern for 20% who failed to comply even 80% of expected value in 170cm height group. In females with 160 cm height good number of participant 58.33% just touched 80% which is minimum expected value. In females the condition is bit better with all clearing 80% and 33.33% showing above average results while 8.33% showed expected value.

CONCLUSION

Further studies are required for prolonged period to ascertain if Green tea is actually improving PEFR Further it is expected that regular consumption of Green tea will definitely have good results on PEFR and lungs function as it helps to clear the respiratory passage by little bronchodilator effect. Further in winter season it may have additional effects as Hyson[10] tea contains good and consistent quantity of catechins –active ingriedients and methyxanthine alkaloids having bronchiodialator effects.

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