STUDY THE EFFECT OF GREEN TEA ON HYPERLIPIDIMIC AND HYPERTENSION PATIENTS [+]

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Abstract:

The miracle of the Green tea is for promote the health particularly the heart-vascular diseases has been suggested by Chinese for many years. This study revealed that there is a significant differences between the levels of total cholesterol, low-density lipoprotein cholesterol and triglycerides before and after taking of 3 cups daily of green tea for 90 days by 52 hyper-lipidemic patients (23 female, 29male) (P< 0.01). Furthermore, this study showed a significant difference between the diastolic and systolic levels before and after 5 cups of green tea taking for 90 days by (49) hypertensive patients (23 female, 26 male) (P< 0.01). The conclusions that continuous consuming green tea enhances the health promotion by decrement of lipid profile and help good blood pressure. One cup=150 ML

المستخلص:

إن استهلاك الشاي يرتبط بتناقص خطورة التعرض لأمراض القلب الوعائية و بالذات الشاي الأخضر.أن معجزة الشاي الأخضر هي في المحافظة على الصحة خصوصا" أمراض القلب الوعائية. أظهرت هذه الدراسة إن هناك فرقا" معنويا" بين مستوى الكولسترول الكلي، الدهون البروتينية ذات الكثافة الواطئة و الكليسيريدات الثلاثية قبل و بعد استهلاك ٣ أكواب من الشاي الأخضر يوميا" لمدة (٩٠)يوما من قبل ٥٢مريضا"(٢٣ اناث،٢٩ ذكور) مصابين بفرط الشحمية (P< 0.01) . كذلك بينت هذه الدراسة إن هناك انخفاضا" معنويا " بمستوى ضغط الدم قبل و بعد استهلاك(٤٩) مريضا (٢٣ نساء، ٢٦ رجال) مصابين بارتفاع ضغط الدم لـ ٥ أكواب يوميا" من الشاي الأخضر لمدة (٩٠ يوما) ،(P<0.01) . يستنتج من ذلك إن استهلاك الشاي الأخضر باستمرار يساعد على إدامة الصحة من خلال تقليص مستوى الشحوم في الدم و بالتالي انخفاض ضغط الدم.الكوب الواحد =١٥٠مل

Introduction:

Tea has been known to use in China as a medicinal beverage to promote health for about 5000 years and the first shipment of tea to Europe in 1606 by the Dutch East India Company was green tea. [1]. Green tea (*ryokucha*) is so ubiquitous in Japan that is more commonly known as tea (*ocha*) and even "Japanese tea" (*nihoncha*) [2].

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There are three main varieties of teas: green, black and oolong. The difference between the teas is in their processing. Green tea (Camellia sinensis) is made from unfermented leaves and is reputed to contain the highest concentration of polyphenols, chemicals that act as powerful antioxidants. Antioxidants are substances that scavenge free radicals-damaging compounds in the body that alter cell membranes, tamper with DNA and even cause cell death. Free radicals occur naturally in the body but environmental toxins (including ultraviolet light, radiation, cigarette's smoke and air pollution) can also increase the No. of these damaging particles [3]. Free radicals are believed to contribute to the aging process as well as the development of a number of health problems including cancer and heart disease.

Green tea has demonstrated an ability to lower total cholesterol and raise HDL (High density lipid "good" cholesterol in both animal and people. The results from an animal model study suggest that polyphenols in green tea may block the intestinal absorption of cholesterol and promote its excretion from the body [4-5]

This effect of the green tea is related to its antioxidant polyphenols enrichment contents (catechins, flavonols, theaflavins, and thearubigins). These polyphenols inhibit LDL (low density lipid) lipid peroxidation and play a crucial role in reduction the development of aortic atherosclerosis in rabbits [6].

This effect is not restricted to animal. Studies denoted that green tea catechin's has effects on preventing the oxidation of LDL in human by measuring plasma phosphatidylcholine hydroperoxide (PCOOH) as a marker of oxidized lipoproteins [7]

This research is a trial to estimate the green tea effects on cholesterol and therapy blood pressure.

Materials & Methods:

This study was carried out during the period between June/ 2006 and September / 2007. Two patients' groups were included in this study: hyperlipidemic and hypertensive groups. Seventy eight hyperlipidemia patients (47 males and 40 females) only (29 males,23 females) were effected from using green tea the other patients effect but either little or only one data effect so we have taken the effected patients only, they were drinking 3 cups of green tea daily, age range between (46-60) years. Sixty fife hypertensive patients (35 males and 30 females) with age range between (28-38) years has been undergone daily drinking 5 cups of green tea (respectively) for 90 days, also 59 only effected (23 males, 26 females) .[Each coup=150 ML]

The levels of Triglycerides (TG), Low density lipid cholesterol (LDL) , High density lipid cholesterol (HDL) and Total cholesterol (TCH); have been estimated among hyperlipidemia patients, using enzymatic, colorimetric method before and after taking the green tea. The diastolic and systolic blood pressure has been estimated among the hypertensive patients before and after having green tea. Blood pressure has been measured by using wrist-type digital blood pressure monitor.

Statistical Analysis:

All the results have been analyzed statistically using (t-Test) [8].

Results:

I- Hyperlipidemia Patients:

The levels of total cholesterol Tch, LDL ch, HDL ch and TG are listed in table 1 before and after experiment for males:

Table 1: Mean of Tch, LDL, HDL, and TG levels in the sera of hyperlipidemic patients males

Levels of lipid substances (mg/ 100 ml)	Before Drinking Green tea *	After drinking Green tea
Total Cholesterol	384 ± 4	257 ± 3
Low Density Lipid (LDL)	220 ± 2	164 ± 2
High Density Lipid (HDL)	39.7 ± 1.4	41.2 ± 1.3
Triglycerides (TG)	240 ± 2	166 ± 2

* = Mean ± SD

This table shows that all the above parameters have been decreased after green tea intake except for HDL cholesterol.

The same parameters have been listed in table 2 for hyperlipidemic females:

Table 2: Mean of Tch, LDL, HDL, and TG levels in the sera of hyperlipidemic females

Levels of lipid substances (mg/ 100 ml)	Before Drinking Green tea *	After drinking Green tea
Total Cholesterol	378 ± 3	235 ± 3
Low Density Lipid (LDL)	216 ± 2	162 ± 2
High Density Lipid (HDL)	39 ± 1	40.1 ± 1
Triglycerides (TG)	238 ± 2	164 ± 2

*** = Mean ± SD . # = Hypertension defined as > 140 / 90 mmHg for age (25-38) years [9-10].**

Table 2 reveals that all the lipid parameters has been decreased except for HDL cholesterol.

The correlation between the data for males and females revealed that there is no significant difference for all the above parameters ($P > 0.05$). While the results before and after treatment with the green tea shows high significant differences for both males and females ($P<0.01$) for all the lipid parameters except for HDL ch

II- Hypertensive Patients:

The results for systolic and diastolic readings before and after green tea intake were listed in table 3 below for males and females.

Table 3: Mean of Blood pressure before and after treatment with Green Tea.

Gender	Blood Pressure before green tea intake *		Blood Pressure after Green tea intake	
	Systolic	Diastolic	Systolic	Diastolic
Males	16.8 ± 0.3	10.3 ± 0.12	14 ± 0.13	9 ± 0.1
Females	16.7 ± 0.3	10 ± 0.1	13.8 ± 0.1	8.8 ± 0.1

*** = Mean ± SD.**

Table 3 reveals there is a significant difference between diastolic and systolic blood pressure before and after green tea intake ($P< 0.01$), rather than between males and females.

Discussion & Conclusions:

It is well known that cholesterol is mostly insoluble in water and present in the circulation as a lipoprteins that in liver converted into low density lipoprotein (LDL) and high density lipoprotein (HDL). The only difference between the two is in the carrier molecule which is very important in maintaining the healthy lifestyle. LDL cholesterol is often called the "bad cholesterol", passes through the liver and flows to other cells where deposits are left to form on artery walls. These deposits can lead to Ateo-sclerosis and many others complications such as high blood pressure, heart disease and stroke [9,10]. HDL cholesterol is often referred as the "good cholesterol". It prevents excess fats from depositing in the arteries. Total cholesterol level < 200 mg /dl is desirable for maintaining a healthy heart and lowering the risk for heart disease development. Therefore it is important to maintain a 5:1 ratio of LDL to HLD cholesterol [11]. It was demonstrated that green tea consumption is associated with reduced risk of coronary heart disease [12,13]. It was denoted that this effect is due to reduction in Tch, LDL ch, and TG and increment of HDL ch in a significant manner. The strong antioxidant catechins content of green tea increase the HDL ch. This is true as has been shown by this study, although the elevation in HDL ch was non-significant. The explanation for this variation is due to the small sample size which has been studied since the experiment depends on patient's decision.

The current study revealed no significant effect for gender on the lipid profile with the green tea intake between males and females.

Diet, exercise and weight management all play an important role in regulating blood pressure and preventing cardiovascular disease. Certain individuals who follow the DASH (Dietary Approaches to Stop Hypertension) diet have been shown to lower their blood pressure. The accumulation of lipid deposits and its precipitation on the walls vessels play a crucial role in raising the chance for heart disease development particularly those related to high blood pressure. This study is a trial to study the effect of green tea on blood pressure. There is a significant decreasing in blood pressure after green tea consumption as has been demonstrated by this study. This is true as compared with other [14,15,16]

Studies denoted that green tea prevents clot formation and development of inflammation in the vessels' walls which enhance inhibition of heart attacks and stoke due to tea catechin’s inhibition of cholesterol oxidation accompanying oxidation of low density lipoprotein [17,18,19].

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