A COMPARISON OF GREEN TEA EXTRACT VERSUS VITAMIN B6, 9, 12 IN REDUCING HOMOCYSTEINE LEVELS IN STABLE CORONARY HEART DISEASE PATIENTS

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ABSTRACT

Homocysteine is the major risk factor of surveillance in patients with coronary heart disease, this study will use green tea to reduce Homocysteine levels in plasma compared with using vitamin B6,9,12.

Objectives: To evaluate and comparing of Green tea versus vitamin B6, 9, 12 of Reducing Plasma Homocystein levels in Stable coronary heart disease patients.

Materials and Methods: Thirty Thai patients with stable coronary heart disease were included in a randomized controlled observer-blinded study. These patients were divided into three groups: green tea group, vitamin B group and placebo group. Each group has to take blood sample of Homocysteine level before study. And after one month of consuming supplement, blood exam will be done again for comparing Homocysteine level before and after study.

Keywords: Homocysteine/Green tea/Vitamin B

INTRODUCTION

Nowadays, the most cause of death worldwide comes from heart disease. But 25-30 percent of cases have normal blood pressure, lipid level and non smoking. So there are some factors that play roles in this disease that no one detected.

Recently doctors and scientists all over the world are interested in the new factor called "Homocysteine", which is one of the important factors that can cause cardiovascular disease. Homocysteine is made from digestion of protein. Normally, human body tries to get rid of Homocysteine by turn it into Cysteine that cause no harm to our body. We barely know the level of Homocysteine unless getting blood tested. Scientists think the reason that Homocysteine dangerous because it could increase viscosity of platelets and make the vessels lack of flexibility.

If Homocysteine levels are higher than normal, it can damage the blood vessels especially the small one such as coronary artery or brain vessel. So the patient will face with Alzheimer disease, Ischemic heart disease or Stroke.

Currently we use vitamin B6, 9, 12 to decrease Homocysteine levels.

One of the most popular well-known supplements in these days is Green Tea. It contains Catechins that are very helpful in terms of Anti-oxidant, Anti-inflame and Anti-cancer.

From its benefits, this study wants to compare green tea with vitamin B6, 9, 12 for reducing Homocysteine levels.

According to the previous study of F.Jalali MD and team in the topic "The Effects of Green Tea on Serum Lipids, Antioxidants, and Coagulation Tests in Stable Coronary Artery Disease: A Prospective Interventional Study" ,they study the effects of using green tea in heart disease patients. The result shows that green tea can reduce Homocysteine levels significantly.

There were many studies that use vitamin B to reduce homocysteine, so the doses of vitamin B are vary. The following previous study from Christine M., that designed a study within an ongoing randomized trial of antioxidant vitamins, 5,442 female US health professionals 42 years of age or older, with either a history of CVD or three or more coronary risk factors were randomized to a combination pill containing folic acid, vitamin B6, and vitamin B12 or a matching placebo and were followed for 7.3 years from April, 1998 until July, 2006 using 2.5 mg of folic acid, 50 mg of vitamin B6, and 1 mg vitamin B12.

Over the longest follow-up recorded thus far, a combination of folic acid/vitamin B6/vitamin B12 did not reduce a combined endpoint of total cardiovascular events among high-risk women despite significant Homocysteine lowering.

OBJECTIVE
Compare green tea with vitamin B6, 9, 12 for reducing plasma Homocysteine level.

METHOD
Thai men and women age 25 – 90 years old with diagnosed coronary artery disease that's follow-up at Mongkut Wattana Hospital. Choose the volunteer, give them information for objective methods, and explain the possible risks and benefits, then the patients sign in consent form. The volunteers are taken blood sample for Homocystein level, and divided into three groups by sampling technique.

Group A12 volunteers will receive green tea (4 gram per day) (Jalali et al., 2008)
Group B12 volunteers will receive vitamin B complex (2.5 mg of folic acid, 50 mg of vitamin B6, and 2.5 mg vitamin B12) (Albert et al., 2008)
Group C 6 volunteers will receive placebo

Orders volunteer to take supplement every day, group A consume green tea 4 grams per day (in 2 divide dose – 4 caps morning and 4 caps evening after meal), group B take B complex 1 cap twice daily and group C take Placebo 1 cap twice daily. Volunteers consume their own supplement every day .After 1 month the volunteer will have a blood exam for Homocysteine again.

STATISTICAL ANALYSIS

Descriptive statistics
Qualitative data etc. Gender, smoking, alcohol drinking, coffee drinking, physical activity, previous vitamin B or folic intake and kidney disease reported by number and percent
Quatitative data etc. Age, BMI, level of Homocysteine, reported by Mean±SD
Inferential statistics
Comparison of baseline characteristic between 3 groups by Fisher exact test
Comparison of Homocysteine before and after within group by paired t-test
Comparison of Age BMI and Homocysteine change between 3 group by One-Way ANOVA and Multiple Comparisons by Scheffe method

Comparison of Homocysteine change between 3 group (subgroup analysis of coffee drinking) by Kruskal -Wallis H test and Multiple Comparisons by Mann-Whitney U test
*every test specifies statistical significance at p-value< 0.05

RESULT

Comparison of Homocysteine between before and after in the same group found that in a group which received green tea and received vitamin B complex, the mean homocysteine decreased statistical significantly (p=0.002) in both groups. Group Placebo show the mean homocysteine level before and after study has no statistically different (p=0.212)
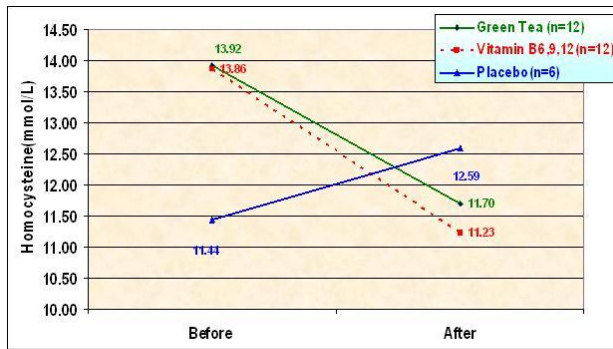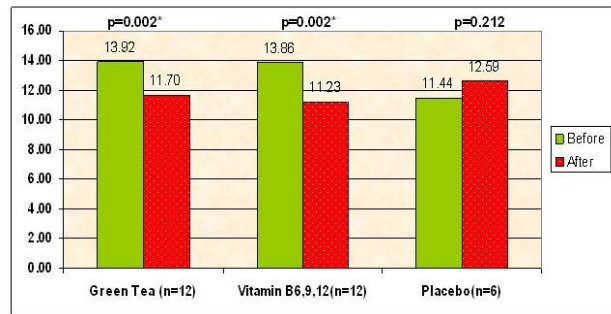

Fig1. Comparison of mean Homocysteine level between before and after in same group

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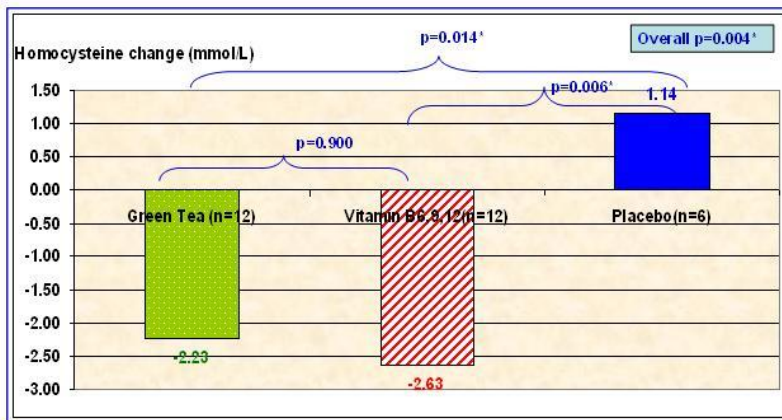**fig 1** Comparison of Mean Homocysteine Level between before and after in the same group

Fig 2. Comparison of mean of homocysteine change between 3 groups

Fig 2 Comparison of Mean Homocysteine change between three groups

Comparison of changing in homocysteine between 3 groups show that mean Homocysteine level in group received green tea decreased by 2.23±1.98 and group received vitamin B complex decreased by 2.63±2.32 which difference from Placebo group that showed the mean homocysteine level increased by 1.14±1.96, the difference between A VS C (p value= 0.014) and B VS C (p value = 0.006) had both statistical significance, respectively. The changing of mean Homocysteine level between a green tea group and a vitamin B complex group (A VS B) were not statistically different from each other (p=0.900)

DISCUSSION

This study is a comparison of Green tea versus vitamin B complex in reducing plasma homocysteine levels in stable coronary artery disease patients. Typically, vitamin B6, vitamin B12 and folic acid were used to lower Homocysteine level due to its role in transformation

Homocysteine into Cysteine and Methionine. Which there was a study that use vitamin B complex reduce Homocysteine (Albert et al., 2008). Another previous study has been used Green tea to decrease Homocysteine level in coronary artery disease patients. The result shows that after 1 month of taking Green tea 4 grams per day mean Homocyeteine level of the sample groups has decrease significantly (Jalali et al., 2008). So this study wants to compare between Green tea and vitamin B complex in reducing Homocysteine levels. And also gather data of factors that affect Homocysteine levels which are Age, BMI, Smoking, Alcohol drinking, Coffee drinking, Physical activity, Previous vitamin B used and Kidney disease (A de Bree, 2001).

Group A the mean Homocysteine before study was 13.92 mmol/L and after took green tea for a month, the level was down to 11.07 mmol/L .Group B after consuming vitamin B complex for a month, the mean Homocysteine level decreased as well from 13.86 to 11.23 mmol/L .In Group C show the slightly increased of mean Homocysteine level after took the Placebo .Comparison of homocysteine between before and after in the same group found that, in group which received green tea and received vitamin B complex the mean Homocysteine decreased statistical significantly (p=0.002) equally in both groups. Group Placebo shows the mean homocysteine level before and after study slightly increased, however it had no statistically different (p=0.212).

Green tea extract can lower Homocysteine level as well as the vitamin B6, 9, 12. But Placebo do not have the effect on plasma Homocysteine.

After one month of taking supplement the result shows that group A has level of Homocysteine down by 2.23 which was 15.21% , meanwhile group B has down by 2.63 which was 17.15% , but Placebo group has increase of mean Homocysteine by 1.14 which is 9.62%

Comparison of changing in homocysteine between 3 groups show that mean Homocysteine level in group received green tea decrease as well as group received vitamin B complex ,which difference from Placebo group that show the mean homocysteine level increase, these differentiations has statistical significance p value =0.014 (A VS C) and 0.006 (B VS C) respectively.

The changing of mean Homocysteine level between a green tea group and a vitamin B complex group (A VS B) are not statistically different from each other (p=0.900)

CONCLUSION
Both green tea and vitamin B can decrease Homocysteine level in coronary patient significantly,
However in comparison between these two supplements shows that they have no different in statistic.

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