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EFFECTS OF SINGLE CLOVE GARLIC GROWING IN YEMEN ON SMOKERS LIPIDS

***Dr. Wael Mustafa Ali Mohammed**

Department of Biology, Faculty of Science, Aden University, Yemen.

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***Corresponding Author**
Dr. Wael Mustafa Ali Mohammed
Department of Biology, Faculty of Science, Aden University, Yemen.

ABSTRACT

Functional food is used for therapeutic properties such as *allium sativum* (Single Clove) of Male Garlic (MG) growing in Yemen. **Methods:** This study was designed to assess the feeding with single clove garlic for smokers. Thirteen healthy smokers were randomly divided into three groups comprising of 10 male smokers. they were administered orally in (MG) daily under the supervision of a physician. Groups A,B and C received (50g, 100g and 200 g) respectively from MG for four weeks. They were administered daily for smokers for 30 days. Lipids levels were determined before and after feeding. **Results:** The results have shown that Lipids levels were decreased in smokers after feeding with Single Clove garlic. **Conclusion:** the hypochoesterolemic properties of MG may probably due to the presence of several phytochemicals content of the male garlic.

KEYWORDS: *Allium Sativum*, Male Garlic, Lipids, Smokers.

INTRODUCTION

Nicotine is one of more than 4700 ingredients in tobacco smoke.[1] Each cigarette contains approximately 8–20 mg of nicotine, the average amount in one cigarette being 12 mg, and merely more than 40 mg nicotine intake at a time is needed to kill an adult.[2] Smoking plays side effects and more dysfunctions of body human smokers such as: Increased leptin and decreased ghrelin[3] Thyroid hormone levels (ACTH and cortisol secretion[4] Serum parathyroid hormone (PTH) levels[5] testosterone levels in adult men[6] erectile dysfunction[7] pituitary hormone secretions in insulin-dependent diabetes mellitus.[8] Effects on the body and bone metabolism by causing decrease Ca+2 absorption, as well as low bone density.[9] Effect of Cigarette smoking on serum liver enzymes.[10,11,12] Effect of cigarette smoke on

immune system.[13] Several studies provided evidence that tobacco is strongly associated with altering the normal status of the lipid profile.[14] Nicotine and other toxic substances from Tobacco smoke are absorbed through the lungs into the blood stream and are circulated throughout the body.[15] Nicotine increases the amount of bad fats (total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and triglycerides (TG)) circulating in the blood vessels and decreases the amount of good fat (high-density lipoprotein cholesterol (HDL-C) availability.[15] Nicotine induces oxidative stress and generates free radicals that attack the membrane lipids resulting in the formation of malondialdehyde (MDA) which causes peroxidative, tissue damage[16] Functional foods and Nutraceuticals provide an opportunity to improve the human health, reduce health care costs and support economic development in rural communities.[17] During the past two decades, the concept of functional food was fast expanding; functional foods beyond the basic nutritional functions have potential benefits to promote health and reduce the risk of chronic diseases.[18] Garlic (Allium sativum) is a member of the Liliaceae family which is one of the most popular herbs used worldwide to reduce various risk factors associated with several diseases.[19] Therapeutic actions of garlic constituents.[20] Effect of garlic (allium sativum) on blood lipids.[21,22] garlic supplement protects against lipid peroxidation inhypercholesterolemic individuals.[23,24]

Garlic is an example of such natural substances that have been claimed to possess beneficial effects for the presentation of various aspects of cardiovascular disease.[25,26] Garlic contains sulfur-containing compounds.[27] The fresh bulb contains an alliin, allicin and volatile oils. When the garlic clove is crushed, the odorless compound alliin is converted to allicin via the enzyme allinase. Allicin gives garlic its characteristic pungent smell.[28] The presence of phenolics, alkaloids, flavonoids, steroids, glycosides, and saponins etc. and the presence of specific functional groups in garlic, Hydroxyl, carbonyl, carboxylic and organo-sulfer compounds.[29]

The objective of this study was to assess the effects of single clove garlic (Male Garlic) growing in Yemen on smokers lipids.

MATERIALS AND METHODS

Plant Material

The *Allium sativum* Single Clove Garlic (Male Garlic) was collected from the markets of Sana'a governorate, Yemen. The plant was identified and authenticated by the Department of Biology, Faculty of Science, Sana'a University, Yemen.

Design of Experiment

Thirteen healthy smokers were randomly divided into three groups comprising of 10 male smokers. They were administered orally in (MG) daily under the supervision of a physician.

Group A received (50g MG) for four weeks, Group B received (100 MG) for four weeks and Group C received (200 MG) for four weeks.

Determination of Serum Parameters Levels for

-Total cholesterol levels (TC).

-Low-density lipoprotein cholesterol levels (LDL-C),

- High-density lipoprotein cholesterol levels (HDL-C)

-Triglycerides levels (TG)

The parameters were determined using randox diagnostic kits method.

They were estimated before feeding by MG and after feeding at four weeks.

Statistical analysis

The results are expressed as mean± S.D. The statistical analysis was carried out using paired t-test and One-way analysis (ANOVA).The SPSS program was used to analyse the data collected.

RESULTS

The results indicated that the smokers lipids levels was high before supplement intake male garlic in comparison with after feeding with MG on Lipids in smoker. The results in Tables (1) show that the levels of TCHO, Table (2) show the levels of TG, Table (3) displays the levels of LDL. Lipids in smokers decreased in all groups after feeding with, MG for a period of four weeks and the level of HDL was increased as shown in table (4).

Table (1): The Effects of Feeding with Male Garlic on Total Cholesterol mg/dl Smokers Lipids.

Parameters	**TCHO mg/dl**	
Groups	**Before Feeding**	**After 4 week**
A: 50g MG *(n :10)*	129.80± 1.14	125±1.25
B:100g MG *(n :10)*	122±1.76	110±1.83
C: 200g MG) *(n :10)*	138±211	112±1.49

Table (2): The Effects of Feeding with Male Garlic Triglycerides levels (TG) mg/dl Smokers Lipids.

Parameters	TG mg/dl	
Groups	**Before Feeding**	**After Feeding**
A: 50g MG *(n :10)*	89.10±3.24	62.23±1.22
B:100g MG *(n :10)*	134.50±3.87	119±1.94
C: 200g MG) *(n :10)*	135±2.83	121±3.27

Table (3): The Effects of Feeding with Male Garlic on Low-density lipoprotein cholesterol levels (LDL-C) mg/dl Smokers Lipids.

Parameters	LDLc mg/dl	
Groups	**Before Feeding**	**After Feeding**
A: 50g MG *(n :10)*	62.23±1.22	58±1.22
B:100g MG *(n :10)*	68.40±1.22	59.30
C: 200g MG) *(n :10)*	61.70±1.25	41.87±1.89

Table (4): The Effects of Feeding with Male Garlic High-density lipoprotein cholesterol levels (HDL-C) mg/dl Smokers Lipids.

Parameters	HDLc mg/dl	
Groups	**Before Feeding**	**After Feeding**
A: 50g MG *(n :10)*	30.50±1.56	32.40±1.41
B:100g MG *(n :10)*	31.80±1.68	36.80±1.21
C: 200g MG) *(n :10)*	28.60±1.36	37.70±1.52

DISCUSSION

The results of the study show significant decreased lipids levels at smokers after supplementation with male garlic in comparison with taking the same before. Early studies on the inhibition of cholesterol synthesis by garlic indicated that inhibition of HMG-CoA reductase.[30,31] The antiatherogenic effects of these organosulphur compounds can be attributed to such reactions that inhibit HMG-CoA reductase and other lipogenic enzymes.[32] Smoking plays the key role in atherosclerotic process and with coronary artery disease.[33] Nicotine and other toxic substances from tobacco smoke are absorbed through the lungs into the blood stream and are circulated throughout the body. These substances damage the blood vessel walls, which allow plaques to form at a faster rate than they would in a nonsmoker.[15] Nicotine increases the amount of bad fats (total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and triglycerides (TG)) circulating in the blood vessels and decreases the amount of good fat (high-density lipoprotein cholesterol (HDL-C) availability.[15] Nicotine induces oxidative stress and generates free radicals that attack the membrane lipids resulting in the formation of malondialdehyde (MDA), which

causes peroxidative, tissue damage.[34] Various mechanisms leading to lipid alteration by smoking are: (a) nicotine stimulates sympathetic adrenal system, leading to increase secretion of catecholamines resulting an increase in lipolysis and an increase in the concentration of plasma free fatty acids (FFA), which further results in an increase in the secretion of hepatic FFAs and hepatic triglycerides along with VLDL in the bloodstream[35] (b): Fall in estrogen levels occurs due to smoking, which further leads to a decreased in the HDL.[36,37,38]

Protective effects of organosulphur compounds of garlic on atherosclerosis have been attributed to its capacity to reduce the lipid content in arterial wall. These compounds cause direct antiatherogenic (preventive) and antiatherosclerotic (causing regression) effects at the level of the artery wall.[39] Diallyl disulfide, Suppress oxidized LDL-induced vascular cell adhesion.[40] Alliin and Ellicin inhibition of hepatic hydroxyl methylglutaryl-CoA reductase activity.[41] The hepatoprotective effect of single clove garlic demonstrated may enhance its therapeutic benefits as a potential preventive intervention for free radical-mediated liver injury.[42] The mechanism by which garlic reduces cholesterol is that garlic blocks HMG-CoA reductase, a key enzyme, which controls the rate of cholesterol synthesis in the liver.[43] Finally: Our results was in agreement with previous studies.[44,45,46,47,48,49,50,51,52,53]

CONCLUSION

The results clearly demonstrate the importance of the male garlic lowering lipids smokers. It is recommended that supplementation with male garlic for smokers prevent high levels lipids and risk of injury cardiovascular diseases.

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