ORIGINAL ARTICLE

Ten Grams Daily Intake of Fresh Garlic Lowers Blood Pressure and increases HDL-Cholesterol

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ABSTRACT

Aim: To investigate effects of using fresh garlic, 10 grams daily for three months in hypertensive and hyperlipidemic patients.

Duration and place of study: Lahore General Hospital Lahore, from January 2014 to October 2014

Methods: Forty already diagnosed hypertensive plus hyperlipidemic patients, age range from 18 to 70 years, of both genders were included in the research study. Their medical data was recorded already designed and approved Performa. They were divided in two groups, twenty in each. Group A was allocated for control, including 20 mild hypertensive and mild hyperlipidemic patients. For determination of changes in tested parameters, paired "t" test was applied and data was statistically analyzed by new version of SPSS. P-value >0.05 was determine for non significant changes, P-value <0.05 was labeled as significant, P-value <0.01 as significant and P-value <0.001 as highly significant.

Results: It was observed and proved that 10 grams of fresh garlic without skin changed systolic blood pressure in 18 hypertensive patients from 160.29±1.67 to 130.91±2.30mmHg.. In these patients diastolic BP decreased from 101.23±2.10 to 92.31±1.91mmHg. The parameter HDL-Cholesterol in these 18 patients increased from 39.65±2.31 to 46.51±2.00 mg/dl in three months. In control group systolic blood pressure increased from 130.23±3.61 to 130.91±6.12mmHg, which is non significant change in this parameter when analyzed statistically (p value >0.05). Diastolic BP decreased from 97.91±3.16 to 97.19±3.11mmHg, but it is non significant reduction (p value >0.05). HDL-cholesterol increased from 39.62±2.22 to 39.93±6.01 mg/dl, but statistically it is non significant change.

Conclusion: It was concluded from this research study that daily intake of specific amount (10 grams) of fresh garlic can reduce risk of secondary Hyperlipidemia and high blood pressure leading to atherosclerosis, and myocardial infarction.

Keywords: Garlic, blood pressure, HDL cholesterol

INTRODUCTION

Hypertension, increased levels of LDL-cholesterol, VLDL-cholesterol, triglycerides, and low plasma HDL-cholesterol are scientifically proved risks for many heart diseases, including ischemic heart disease, cardiac failure, and myocardial infarction[1]. By increasing good cholesterol (HDL-Cholesterol) in human body and normalizing systolic and diastolic blood pressure, risk factor of heart diseases can be reduced[2]. There are many allopathic and pharmacognotic drug groups which can reduce systolic, diastolic blood pressure reduce plasma bad-lipids and increase good cholesterol (HDL-Cholesterol). Garlic (Allium sativum) is one of them[3]. With a history of human use of over 7,000 years, garlic is native to central Asia, and has long been a staple in the Mediterranean region, as well as a frequent seasoning in Asia, Africa, and Europe. It was known to Ancient Egyptians, and has been used for both culinary and medicinal purposes[4]. Garlic contains vitamin B-1, B-2, B-3, B-5, B-6, B-9, vitamin C and trace metals like, sodium, potassium, calcium, phosphorus, iron, zinc, magnesium, and manganese. Many of these vitamins and trace elements possess hypotensive, hypolipidemic and antioxidant characteristics[5].

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SUBJECTS AND METHODS

Study was conducted in General Hospital Lahore, Pakistan from January 2014 to October 2014. Duration of study was 3 months. Written consent was taken from all participants and got approval from Research Ethics Committee, Lahore General Hospital, Lahore. Forty already diagnosed hypertensive plus hyperlipidemic patients, age range from 18 to 70 years, of both genders were included in the research study. At the start of study, they were physically examined, inquired about past medical history, inherited diseases, medications used, abuse of any substance. Their medical data was recorded

already designed and approved Performa. They were divided in two groups, twenty in each. Group A was allocated for control, including 20 mild hypertensive and mild hyperlipidemic patients. They were advised to come in medical OPD of General hospital every month for putting their blood samples. They were on normal diet, and were advised not to take any medicine for their hyperlipidemic and hypertensive state for the period, research is being carried. Group B was being tested group, including twenty moderate to severe hypertensive and hyperlipidemic patients. They were advised to take fresh, without skin Garlic 10 grams daily, at any time as their convince, with or without meals for the period of three months. They were called to come medical department of the hospital for medical checkup and donating blood sample for determine their lipid profile. HDL-cholesterol was determined by direct method using kit Cat. # 303210040 by Eli Tech diagnostics, France[6]. Their systolic and diastolic blood pressure was measured by digital pharmevo made up sphygmomanometer. For determination of changes in tested parameters, paired "t" test was applied and data was statistically analyzed by new version of SPSS. P-value >0.05 was determine for non significant changes, P-value <0.05 was labeled as significant, P-value <0.01 as significant and P-value <0.001 as highly significant.

RESULTS

When results were compiled, on completion of research study, it was observed and proved that 10 grams of fresh garlic without skin changed systolic blood pressure in 18 hypertensive patients from 160.29±1.67 to 130.91±2.30mmHg. Over all change in units was 29.40 mm of Hg, which is highly significant reduction in the parameter, when analyzed statistically (p value <0.001). In these patients diastolic BP decreased from 101.23±2.10 to 92.31±1.91 mm of Hg. Overall change in units was 08.90 mm of Hg in three months, which is significant change biostatistically (p value <.01). The parameter HDL-Cholesterol in these 18 patients increased from 39.65±2.31 to 46.51±2.00 mg/dl in three months. Overall change in units was 06.90 mg/dl, which is significant biostatistically (P value <0.05). Two patients from tested group withdrew taking garlic due to low compliance, i.e., its taste and amount. In control group systolic blood pressure increased from 130.23±3.61 to 130.91±6.12mmHg, which is non significant change in this parameter when analyzed statistically (p value >0.05). Diastolic BP decreased from 97.91±3.16 to 97.19±3.11mmHg, but it is non significant reduction (P value >0.05). HDL-cholesterol increased from 39.62±2.22 to 39.93±6.01 mg/dl, but statistically it is non significant change (p value > 0.05).

Table: Baseline and post treatment values of blood pressure and HDL-cholesterol in Control and Tested Group

Control group (n=20)	**SBP**	**DBP**	**HDL-C**
Day-0	130.23±3.61	97.91±3.16	39.62±2.22
Day-90	130.91±6.12	97.19±3.11	39.93±6.01
Change in units	0.68 mm of Hg	0.72 mm of Hg	0.30 mg/dl
Significance	P >0.05	P >0.05	P >0.05
Tested group (n=18)	SBP	DBP	HDL-C
Day-0	160.29±1.67	101.23±2.10	39.65±2.31
Day-90	130.91±2.30	92.31±1.91	46.51±2.00
Change in units	29.40 mmHg	08.90 mmHg	06.90 mg/dl
Significance	P<0.001	P <0.01	P <0.05

KEY: n in parentheses indicates sample size, SBP stands for systolic blood pressure, DBP stands for diastolic blood pressure, HDL-C stands for high density lipoprotein cholesterol, SBP and DBP values are measured in mm of Hg, HDL-C is measured in mg/dl, P-values >0.05 means non-significant change, p-value <0.05 means significant change, p-value <0.01 means moderately significant change and p-value <0.001 means highly significant change

DISCUSSION

Fresh garlic is one of the important food ingredients in daily dietary intake in Pakistan. Garlic contains vitamins and trace minerals, which act as antioxidant in human body. It was proved in many research laboratories that reducing oxidation stress, may play major role in escaping from mortality and morbidity due to atherosclerosis, and other heart diseases. In our research study results systolic and diastolic BP were decreased 29.40mmHg and 8.90mmHg respectively. Biostatistically these results are significant, proving p-values <0.001 to <0.01 respectively in these parameters. These results match with results proved by Ried, K et al[7] who proved almost same changes in systolic and diastolic blood pressure in 80 hypertensive agents, when treated by 10 grams of garlic for the period of fourth months. He also stated that fresh garlic alone can reduce both fractions of blood pressure, remarkably. Our results are in match with results observed and proved by Ackermann RT et al[8] who did conduct trial

of 20 grams of garlic used in divided doses for the period of one month in 60 hypertensive and hyperlipidemic patients. They proved 29.14mmhg reduction in systolic blood pressure and 11.98mg/dl increase in HDL-cholesterol in tested individuals. HDL-cholesterol in our study increased 6.90 mg/dl by using 10 grams of fresh but without skin garlic for the period of three months. These results matched with results of study conducted by Ashraf R et al[9] who also observed same significant changes in lipid profile. Silagy, C and Neil A[10] stated that fresh garlic is being used by many allopathic and homeopathic related health personals, all over the world. Poor compliance of taking fresh garlic without skin is observed all over the world. Many pharmaceutics have changed this poor compliance to good, by making pharmaceutic- related tablets and capsules[11]. Our results are opposite to results gained by study conducted by Borrelli F et al[12] who proved 09.18 mm of Hg reduction in systolic blood pressure and 0.87 mm of Hg reduction in diastolic blood pressure in 29 hypertensive patients. This contrast in results may be due to environmental, demographic and genetic variance in two reserach studies. Our results do not match with results of research study conducted by Caron MF, and White CM[13] who observe very low amount of HDL-cholesterol increase in 50 hyperlipidemic patients, when they used 5 grams of garlic in 14 hyperlipidemic patients for one month. Their inclusion criteria was diabetic patients. Change in two study results are self explanatory, because diabetic and non-diabetic patients responded differently, due to change in their neurotransmitter levels, already pathological victimization by diabetes mellitus, complications in vital organs due to diabetes. Dillon SA et al[14] have mentioned that fresh garlic is poor source for increase in HDL-cholesterol, especially in severe hyperlipidemic and having abnormal body mass index (BMI) individuals. However, fresh garlic has characteristics to synergize and potentiate hypolipidemic effects of other well proved antihyperlipidemic drugs, when taken in combination as so[15]. Our results are in contrast with results of research study of Gardner CD et al[16] whose results were 14.14 and 1.99mmHg decrease in systolic and diastolic blood pressure respectively. HDL-cholesterol in their tested patients increased from 40.97 mg/dl to 41.98 mg/dl in 9 months, when fresh garlic was taken by 100 patients suffering from hyperlipidemia and primary hypertension. In this wide change in 2 study results may be physical exercise and restricted diet which was their primary protocol for patient's registration.

CONCLUSION

It was concluded that daily intake of specific amount (10grams) of fresh garlic can reduce risk of secondary Hyperlipidemia and high blood pressure leading to atherosclerosis, and myocardial infarction.

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