

The effects of consumption of walnut on serum lipids amount of normolipidemic and hyper lipidemic human

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ABSTRACT

The objective of this study was accessing to the results of consumption of walnut with various amounts and during different consumption time on serum lipids amount. The number of researches on useful effects of walnut consumption on humans are few. In this study, desirable and effective amounts of walnut and the results of its continued consumption are considered in both normolipidemic and hyperlipidemic groups. 130 persons randomly selected and after doing blood fatness tests they divided into two groups (60 persons with hyper lipidemic and 70 persons normo lipidemic statistical) and were tested by different amounts of walnut for one or two months.

The average amount of total cholesterol, LDL-C, HDL-C/LDL-C, triglyceride and VLDL in all the patients were 219, 134, 215, 39 mg percent before beginning of walnut consumption, that at the end of study after consuming walnut these figures were declined to 180 ($p < 0.001$), 107 ($p < 0.001$), 3.12, 173 ($p < 0.005$) and 30.9 ($p < 0.017$) mg that showed significant decrease. The change of serum lipids spectrum remained in both group till one month after stopping walnut consumption and the average amount of cholesterol, LDL-C, LDL-C/HDL-C never reached to the amounts before beginning of walnut consumption walnut consumption have binary effect on hyper triglyceridemic.

The present study results show that walnut consumption has useful effects on spectrum change of serum lipids. Its effect in hyperlipidemic persons and average consumption amount of 79 g daily is more desirable. Continuation of consumption again decreases harmful lipid levels of blood and even its effect remains 1 month after stopping walnut consumption. The walnut diet was well tolerated, planned and observed diets were closely matched. Therefore, it is recommended that walnut can be used as lowering blood cholesterol in humans.

Key words: Coronary heart disease, cholesterol, triglyceride, medicinal plants.

INTRODUCTION

Walnut (*Juglans regia* L.) is described as an anticancer, tonic, blood purifier, and detoxifier agent. It is said that nuts have favorable fatty acids and nutrients. This study was performed to determine the lipid-lowering properties of walnut¹¹.

Coronary disease (or coronary heart disease) refers to the failure of coronary circulation to supply adequate circulation to cardiac muscle and surrounding tissue. It is already the most common form of disease affecting the heart and an important cause of premature death in Europe, the Baltic states, Russia, North and South America, Australia and New Zealand. It has been predicted that all regions of the world will be affected by 2020¹. 58 million American have at least one form of Coronary

heart disease (CHD). 50% of all cardiac deaths result from CHD.

Recent reports suggest that the regular consumption of nuts might reduce cardiovascular risk⁵. Walnuts are particularly rich in polyunsaturated fatty acids⁶, and epidemiologic evidence suggests that frequent walnut consumption protects against coronary heart disease⁷.

With attention to the principle of "prevention better than cure" if walnut consumption leads to decrease of harmful lipid of blood, one can take a step toward preventing of heart disease by propagation of its consumption. Several researches were done in other countries about useful effect of dried fruit consumption but few researches were done about the effect of walnut on blood lipids, that

these researches were done on healthy persons. It was shown that frequent consumption of nuts in the daily diet was associated with a potentially decreased risk of coronary artery disease by decreasing the level of triglyceride and increasing the level of HDL. The results obtained from researches on healthy persons can not be generalized about persons with high blood lipid, because enzyme changes in the persons serum is very much in this study. In addition to considering the effect of walnut on hyperlipidemic persons, the sample amounts are increased too.

MATERIAL AND METHODS

In the present study, 121 men were selected randomly (with respect to blood lipids) and after doing primary tests they settled in two equal group (60 hyperlipidemic person and 61 normolipidemic person). None of them have the background of consumption of dried fruits. The procedure for dividing these two groups were 240 g total cholesterol level and 160 mg LDL in persons that lack two dangerous factors and 200 mg total cholesterol and 130 mg LDL in persons with two dangerous factors (other than hyperlipidemic) and 250 mg triglyceride. Values that were more than above hyper lipidemic and less than normo lipidemic were calculated. Age range of persons was 28-65 years (41.9+/- 7.6), size range was equal to 144-190 cm (average 169.8+/- 7.6) weight range of all the persons were 42-110 kg (average 77.5+/- 11.5 in hyperlipidemic and 71.9+/-11.5 in normolipidemic) Cholesterol, LDL-C and serum triglyceride before beginning of walnut consumption were 180-382 (average 243.5), 68-273 (average 152.4) and 115-676 (average 277.8) in hyper lipidemic group and 136-228 (average 190), 68-147(average 152.4) and 150.9 mg in normolipidemic group.

In first and second stages, all the patients participated in test process except 4 persons from all the samples (one person in 75 g daily group and one person in group of 50 g daily and two persons in group of 25 g daily) did not participate in third stage of test.

This research was an experimental – interferential study, that after doing primary tests persons divided into two equal groups viz. hyper

lipidemic and normo lipidemic groups (60 and 61 persons) then each group divided into five equal subgroups (other than a group that were 13 persons, other were 12 persons) in order to test different amounts of walnut in them. After one month, walnut with amounts equal to 25, 50, 75, 100, 125 g were given daily to all the studied persons and during the second month only in half of each subgroup walnut consumption was continued (totally 60 persons in five groups of 12 persons) again the ratio of hyper lipidemic persons were similar.

The experimental diets were individually prescribed and were based on estimated energy requirements. Because participants ate on their own, detailed dietary information was provided to them. The diet should not be more than normal and also it should not lead to fatness and changing the blood lipids profile. Walnut consumption decreased from other food material of persons during day and night. Walnut was consumed between two times of meal or in accompany with food. Group members were under control in a way that the weight increased or decreased than normal as in order of diet was given. The test of serum lipoproteins and its components were done by way of doplikiket by enzyme reagent kits and RA-1000 automatic system made by teknikon factory .

RESULTS

Totally, other than HDL-C, the other lipids including LDL-C, cholesterol, triglyceride and VLDL showed significant decrease in the tests after 1 or 2 months of walnut consumption and in comparison with the results obtained before consuming it. Serum cholesterol amount was declined at the end of first month of consumption from average 243.5 to 204.1 mg ($p < 0.001$) by consuming walnut this decreasing continued and reached to 192.7 mg percent ($p < 0.001$). This change is more evident in hyperlipidemic persons. Serum cholesterol amount increased in persons who did not consume walnut in second month, but the average of cholesterol did not reach to the limits before starting the walnut consumption.

These changes evaluated with regard to different amounts of walnut. Changes curve of serum LDL cholesterol amount is similar to changes curve

of total cholesterol that of 132.8 reached to 104 and then to 104.7 ($p < 0.001$). The changes of LDL cholesterol evaluated on the basis of different amounts of walnut. The serum LDL cholesterol was 48.2 mg percent before beginning of consumption that it increased to 51.6 at the end of first month of walnut consumption ($p < 0.002$) and it decreased again to 48.3 mg percent at the end of the second month ($p < 0.003$). The ratio of LDL-C/HDL-C in all the patients were 4.5 before walnut consumption and it declined to 2.08 one month after consumption. However, it reached to 2.25 two months after starting the consumption. This ratio faced more changes in hyperlipidemic persons in comparison with normolipidemic persons. In hyper lipidemic persons the ratio of LDL-C/HDL-C was equal to 6.6 and after one month it reached to 2.40 and if consumption after two months reached to 2.58 and otherwise reached to 2.7 in second month. Serum triglyceride amount in all the patients was averagely 213.3 before starting walnut consumption that 1 month after consuming it reached to 184 and two months after consuming it reached to 177.5 mg percent ($p < 0.005$). In persons, who consume large amounts of walnut (100 or 125 g) daily, serum triglyceride amount increased considerably.

Therefore, increasing walnut consumption cannot have more effect on decreasing of serum lipids level. On the whole the useful effect of walnut in hyper lipidemic persons was more than normo lipidemic persons. Its effect was meaningful and desirable by consuming 50-100 g amount in a day (average 75 g) so that after stopping its consumption, its effect remained till 1 month.

DISCUSSION

This study was done in order to determine walnut consumption effect by different amounts, determining minimum effective amounts, showing difference of its effect on hyper lipidemic and normo lipidemic persons and determining the duration of the effect after stopping consumption. Dried fruit consumption has protective effect against total and non total coronary heart disease. There is food compound similarity among kinds of dried fruits. Total amount of fatness is high in these materials. These fatness are often unsaturated that just has a little amount of saturated fatness. Fiber amount is high

in dried fruit and is 5.2-14.3 g percent. So other kinds of dried fruits (like almond) are able to decrease serum cholesterol as walnut.

In another study conducted in America in 1994 on almond in 16 healthy men and the results were compared with walnut study. It was specified that their consumption has useful effects on profile change of serum lipids. Fatty acids compound of walnut show that there is possibility of decreasing serum cholesterol level by consuming it. 58% of walnut weight consisted of fatness and the ratio of unsaturated fatness on saturated fatness is high. 12% of walnut fat is linolenic acid. So, walnut is a food that has 3-omega fatty acids that do not add any cholesterol to food diet.

Walnut and dried fruit consumption may effect on function and prostaglandins metabolism and have anti oxide effect. However their proving require wide researches. Following the study that was done for walnut consumption effects on serum lipids in 18 healthy men. It is shown that this food matter changes serum lipids profile in desirable manner, because of the difference of consumption pattern in different societies. It is recommended that similar studies accomplish in other societies in order to obtain better results. We considered the effects of the consumption of walnut on 121 normo lipidemic and hyper lipidemic men in Tabriz in second half of 1373 and early 1374 and we concluded that this food matter changes serum lipid profile.

By decreasing harmful fat level, it is useful to consume 50-100 g daily, but the most desirable amount of its consumption is 75 g (12 complete walnut) daily. The useful effects of walnut consumption are on hyper lipidemic persons more than normo lipidemic persons. The blood cholesterol of those who consume 75 g walnut daily decreased 20% after 1 month when it was compare this effect with lovastin effect (one of the most strongest medicines of decreasing blood cholesterol) it will specified that it does not have much difference with walnut effects because it decreased blood cholesterol about 30% in mentioned time. Levostatin is part of import medicines and in addition to spending foreign exchange impose high expenditure on patients and has secondary indispositions too. Walnut has low price and does not cause important

indisposition and provide food energy and decline the need to other foods. The effects of walnut consumption remain till one month after stopping its consumption that often it does not reach to the amounts before consumption. May be this effect creates as the result of the existence of other elements in addition to special compounds of existent fatness in walnut.

In order to avoiding negative indispositions of common medicines, it is better to recommend to hyper lipidemic (hyper cholesteromic) persons to use this food matter in average amount daily. They can use it with cheese in breakfast and prevent heart disease and finally precocious death. This study demonstrated that walnuts, when consumed as part of a low fat, low-cholesterol diet, have a beneficial effect on serum cardiovascular risk factors

CONCLUSION

Walnut supplementation may beneficially alter lipid distribution among various lipoprotein subclasses even when total plasma lipids do not change. Considering the positive results obtained from the present study, it is advisable to consume 75 g walnut daily for hyper lipidemic persons especially hypercholesteromic ones (about 12 complete walnuts) and if it does not have suitable effect decreasing medicines of blood fatness can be used.

It is also advisable to state authorities to plant more trees of walnut for easy availability and to avoid expenditure related to import of blood cholesterol medicines.

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