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MIRACULOUS APPROACH TO INCREASE HIGH DENSITY LIPOPROTEIN CHOLESTEROL BY CONSUMPTION OF FRUIT

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ABSTRACT

Raised blood cholesterol is one of the important risk factor to develop coronary artery disease (CAD) leading to main cause of mobidity and mortality due to heart attck and cardiac arrhythmias. Decreased level of plasma HDL-cholesterol, independently can cause CAD. Recent research studies have proved that walnuts can increase plasma HDL-cholesterol if taken in specific amount per day regularly. Research study was conducted at Lahore General Hospital, Lahore from January 2023 to April 2023. Forty hyperlipidemic patients were selected from Lahore General Hospital for the study. Age of patients ranged from 20 to 65 years. Both gender male and female patients were enrolled. They were advised to discontinue any hypolipidemic medications and foods. Patients suffering from any metabolic disease, renal impairment, liver disease, and already having any cardiac problems were excluded from the research study. Forty patients were divided in two groups, twenty individuals in each group. Group-1 was advised to take 30 grams of walnuts (without shell) per day for the period of eight weeks. Group-II was considered as control group and was advised not to take any dry fruit including walnuts. Their baseline values of HDL-cholesterol were measured at day-0 and day-60, by separating other lipoprotein fractions using chemical precipitation with Mg^{2+}, then coupling the products of a cholesterol oxidase reaction. In twenty hyperlipidemic patients, two months therapy with 30 grams of walnuts per day increase in HDL-cholesterol was 6.3 mg/dl which was significant change when analyzed biostatistically, showing p-value <0.01. **Statistical analysis:** Mean values with SD and SEM were analysed statistically by using SPSS version 16.1. P-value of <0.001 was considred as significant and p-value of >0.05 was considered as non-significant change. **Conclusion:** It was concluded from the study that regular intake of specific amount of walnuts without shell can increase good cholesterol (HDL-cholesterol) in male and female patients of age range from 18 to 65 years.

KEY WORDS: CAD, HDL, LDL, VLDL, mortality, morbidity, Biostatistics

INTRODUCTION

The average man has an HDL cholesterol level of 40 to 50 mg/dL. In the average woman, HDL levels range from 50 to 60 mg/dl. An HDL cholesterol of 60 mg/dL or higher gives some protection against heart disease. Regular aerobic exercise, loss of excess weight (fat), and cessation of cigarette smoking increase HDL cholesterol levels. When lifestyle modifications are insufficient, medications can be used[1-5]. Walnuts (Juglans regia) are a tree nut belonging to the walnut family.They originated in the Mediterranean region and Central Asia, and have been part of the human diet for thousands of years[6]. Walnuts are rich in omega-3 fats and contain higher amounts of antioxidants than most other foods. Eating walnuts may improve brain health while also helping to prevent heart disease and cancer[7]. Besides being a source of high monounsaturated fat, walnuts are a rich source of antioxidants and omega-3 fatty acids[8-10]. Walnuts contain l-arginine, an amino acid that is linked to reduced hypertension, because it causes blood cells to relax and stay smooth. Since all nuts are high in fat, eating too much can cause to gain weight[11]. The fat found in walnuts is mainly omega-3 fats, a type of monounsaturated fatty acid that has heart-protective qualities. Thus walnuts, Lower total blood cholesterol, Increase HDL [good cholesterol], Decrease LDL [bad cholesterol], Reduce chances of blood clot formation, Reduce inflammation of blood vessels, Relax blood vessels that help to control high blood pressure. Research shows that walnuts [rich in omega-3 fats] boost brain cell activity. Adding some to daily diet helps boost memory in kids and even older people. Recent studies have also indicated the use of walnuts in the treatment of Alzheimer's disease[12]. Walnuts in particular have a unique profile: they are rich in polyunsaturated fatty acids, which may improve blood lipids and other cardiovascular disease risk factors[13]. Walnuts contain l-arginine, an amino acid that is linked to reduced hypertension, because it causes blood cells to relax and stay smooth.

SUBJECTS & METHOD

Research study was conducted at Lahore General Hospital, Lahore from January to April 2023. Forty hyperlipidemic patients were selected from the hospital for the study. Age of patients ranged from 20 to 65 years. Both gender male and female patients were enrolled. They were advised to discontinue any hypolipidemic medications and foods. Patients suffering from any metabolic disease, renal impairment, liver disease, and already having any cardiac problems were excluded from the research study. Forty patients were divided in two groups, twenty individuals in each group. Group-1 was advised to take 30 grams of walnuts (without shell) per day for the period of eight weeks. Group-II was considered as control group and was advised not to take any dry fruit including walnuts. Their baseline values of HDL-cholesterol were measured by separating other lipoprotein fractions using chemical precipitation with

Mg^{2+}, then coupling the products of a cholesterol oxidase reaction. Mean values with SD and SEM were analysed statistically by using SPSS version 16.1. Statistical significant was considered as p-value of changed parameter from day-0 to day-60. P-value of <0.001 was labeled as significant and p-value of >0.05 was considered as non-significant change.

RESULTS

After eight weeks of taking 30 grams of walnuts by 20 patients, their HDL-cholesterol raised from 31.80±1.65 mg/dl to 38.11±1.54 mg/dl. When analysed statistically it was significant change in the parameter (p-value <0.01). This change in percentage was 6.3 %. In controlled group (n=20) rise in HDL-cholesterol was insignificant statistically (p-value >0.05).

DISCUSSION

Walnuts act as antioxidants that help human body get rid of free radicals created in the body because of exposure to pollution, UV radiations, smoke, stress and junk foods. In research studies conducted at high profile public based hospital settings in India, Bangladesh, Pakistan, Iran, and Srilanka it was proved that oxidative stress is reduced by taking walnuts because these contain omega-3 fatty acids. In our research study rise in HDL-cholesterol taken by 20 hyperlipidemic patients for two months, was 6.3 mg/dl. When statistically analyzed it was significant change. These results match with results of study conducted by Rose E et al[14] who observed 8.97 mg/dl increase in HDL-cholesterol when hyperlipidemic patients taken 40 grams walnuts per day for three months. Our results also match with results of research study conducted by Blomhoff R et al[15]. They proved 7 mg/dl increase HDL-cholesterol when 20 grams of walnuts were advised to take by hypercholesterolmic patients for three months. They made conclusion from their study's result that walnuts are rich in vitamin E which is one of the best fat (lipid) based antioxidants. Oxidative stress causes free radicals, and if they are not reduced or eliminated, they cause deterioration of the cells. This oxidative stress is also caused by normal cell metabolism, but is exasperated by a variety of environmental factors, including UV radiation, pollution, tanning, smoke, heavy-metals in the environment. Vitamin E content walnuts protects the cells and cell membranes from free-radical and environmental oxidative stress. They explained that Walnuts also elevate blood levels of melatonin and hence make for a good bedtime snack. Our results are in contrast with results of study conducted by Tapsell LC et al[16] who proved much lesser change in HDL-cholesterol when 10 grams of walnuts were used in 100 hyperlipidemic patients for 4 months. Their results proved only 1.94 % mg/dl rise in HDL-cholesterol. Reason for this difference may be much lesser dose or concentration of substance used for pharmacodynamic effects. They have mentioned that Structured "whole of diet" advice that included 30 g of walnuts/day delivering substantial amounts of polyunsaturated fatty acid improved the lipid profile of patients with type 2

diabetes. Morgan JM et al[17] have explained that polyphenols are over 4,000 distinct species, many of these compounds have antioxidant activity in vitro but are unlikely to have antioxidant roles in vivo. Rather, they may affect cell-to-cell signaling, receptor sensitivity, inflammatory enzyme activity or gene regulation. Approximately 90% of the phenols in walnuts are found in the skin, including key phenolic acids, tannins, and Flavonoids. Cortes B et al[18] have mentioned that walnuts are a vital food for pregnant women. The good supply of proteins and omega-3 fats are good for baby's brain and eye development. Walnuts help breast-feeding women to maintain a healthy milk supply too. Accoding to Morangoni F et al[19-22] walnuts have another health benefit. A solution containing 5% of Vitamin E obtained from walnuts decreased the healing time required and Vitamin E increases the breaking strength of wounds. Vitamin E is required for healthy collagen in the skin – which is the support system in the skin and helps the skin to remain firm and healthy. Many of these compounds have antioxidant activity in vitro but are unlikely to have antioxidant roles in vivo.

CONCLUSION:

After two months therapy with 30 grams of walnuts in 20 hyperlipidemic patient's, it was observed that HDL-cholesterol was increased by 6.3 mg/dl. We concluded that apart from other lipid profile's parameters, HDL-cholesterol may be increased significantly.

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