

Effect of Z Jujube Fruit in Controlling Dyslipidemia in Obese Adolescents

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ABSTRACT

Cholesterol serves much the same purpose in model membranes. Unfortunately, cholesterol presents certain problems when used in human pharmaceuticals. High purity sources suitable for clinical applications are not widely available. Most cholesterol commercially available is derived from egg or wool grease (sheep derived). These animal sources are potentially not suitable for human pharmaceuticals due to the potential viral contamination. Also, cholesterol is readily oxidized creating a stability problem for lipid-based drug products. Some of these oxidation by-products tend to be rather toxic in biological systems. Hypolipidemic drugs and fruits can play a part to reduce LDL particles decreasing chances of CAD development. This study was conducted to compare hypolipidemic effects of Niacin and Jujube fruit in primary as well as secondary hyperlipidemic patients. Study was conducted from November 2015 to February 2016 at Jinnah Hospital Lahore. Sixty participants were enrolled of both gender male and female patients age range from 20 to 70 years. Consent was taken from all patients. They were divided in two groups. Group-I was advised to take 2 grams Niacin in divided doses for the period of two months. Group-II was advised to take 500 grams of fruit Jujube daily for the period of two months. Their baseline LDL and HDL cholesterol was determined by conventional method of measuring Lipid Profile. After two months therapy, their post treatment lipid profile was measured and mean values with \pm SEM were analyzed bio statistically. Group-I which was on Niacin their LDL cholesterol decreased significantly and HDL cholesterol was increased significantly. In group-II patients LDL cholesterol was decreased significantly but HDL increase was not significant with p-value of >0.05 . It was concluded from the research work that Niacin is potent in lowering LDL and increasing HDL cholesterol, while Jujube has significant effect as LDL cholesterol lowering potential, but it does not increase HDL cholesterol significantly.

KEYWORDS

Cholesterol; Sources; Chemical composition; Properties; Human health

INTRODUCTION

Results from studies on atherosclerosis involving feeding experimental animals a diet containing cholesterol stored

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under adverse conditions (room temperature, open to air) could be ambiguous due to the potential presence of significant quantities of oxidized sterols. Hypolipidemic drugs may be used in prevention of heart attack, peripheral vascular disease and ischemic stroke [1]. Commonly used medications for treatment of Hyperlipidemia include Statins, Fibrates, Niacin, and Resins. All these medicines have potential for SEs and low compliance due to one reason or another [2]. Niacin when given in hypolipidemic doses i.e. >2 gm per day it causes partial inhibition of release of free fatty acids from adipose tissue, and increased lipoprotein lipase activity, which may increase the rate of chylomicron triglyceride removal from plasma. Niacin decreases the rate of hepatic synthesis of VLDL and LDL by synthesis of apoproteins which are integral part of LDL or VLDL structure [3]. Some herbs have been proved to reduce plasma lipids in human population. Jujubes or Ziziphus jujube have somewhat hypolipidemic as well as hypoglycemic effects [4]. Jujube fruit is known to contain considerable number of phenolic compounds, including chlorogenic acid, gallic acid, protocatechuic acid and caffeic acid [5]. High polyphenolic content of Z Jujube suggests its potent capacity in clearing of oxidants. Many studies proved the hepatoprotective effect of methanolic extract of Zizyphus jujuba fruits. Histopathological studies supported the biochemical findings. Study concludes a hepatoprotective activity probably due to its antioxidant effect [6]. Some studies evaluated the effect of Z Jujube fruit in controlling dyslipidemia in obese adolescents. A triple-blind randomized placebo-controlled trial of 86 obese adolescents aged 12-18 years with dyslipidemia. Proved its hypolipidemic features. Results showed the fruits to be generally well tolerated, with potential favorable effects on serum lipid profile [7]. This study evaluated the effect of a hydroalcoholic extract of the fruit of Z. Jujube on peripheral blood cells in male and female hyperlipidemic actions. Results showed a significant reduction in percentage of monocytes and neutrophils and an increase in the

percentage of lymphocytes. Remarkable number of researches have proved jujuba fruit as free radicals' scavenger so reduces risk of developing cardiac problems like CAD. This fruit is also helpful as hepatoprotective agent [8,9].

PATIENTS AND METHOD

This research work was conducted from November 2015 to February 2016. Sixty hyperlipidemic patients were selected from National Hospital Lahore-Pakistan to compare hypolipidemic effects of Niacin and commonly used fruit in winter season in Pakistan i.e., Jujube (Bair in urdu). Both male and female patients suffering from primary or secondary hyperlipidemia were selected. The age limit for patients was 20 to 70 years. Exclusion criteria were alcoholics, cigarette smokers, habitual to enjoy sedentary life, with impaired liver or renal functions. Consent was taken from all participants. Baseline Lipid Profile was determined in Biochemistry lab of the Hospital. Patients were divided in two groups, 30 patients in each group. Group-I was on Tab. Niacin 2 grams daily in three divided doses. Group-II was on Jujube 500 grams daily in three divided times to eat. They were advised to take drugs for two months.

STATISTICAL ANALYSIS

Mean values \pm SEM were taken for statistical analysis using SPSS version 26 2015. Paired 't' test was applied to get significance changes in parameters before and after treatment. P-value >0.05 was considered as non-significant change, p-value <0.01 was considered as significant and p-value <0.001 was considered as highly significant change in the parameter.

RESULTS

With two months therapy by Niacin and Jujube, plasma total cholesterol, LDL-cholesterol and HDL-cholesterol were changed, which are shown in following table.

Table showing pre and post treatment mean values with \pm SEM and their significance change in parameters.

	LDL-c	HDL-c
Before treatment	G1= 210.1 \pm 2.11 G2= 198.8 \pm 2.17	37.9 \pm 1.91 38.6 \pm 2.19
After treatment	G1= 180.9 \pm 2.22 G2= 190.9 \pm 1.73	45.2 \pm 2.19 41.9 \pm 2.97
Change in mg/dl	G1= 29.2 G2= 7.9	7.3 3.3
Change in %	G1= 13.9 % G2= 4.0 %	16.2 % 7.9 %
p-value	G1= <0.001 G2= >0.05	<0.001 <0.01

Table 1: Pre and post treatment mean values with \pm SEM and their significance change in parameters.

Key: G1 is group on Niacin, G2 is group on drug-2 i.e., Jujube, \pm stands for SEM, p-value >0.05 is non-significant change, p-value <0.01 is used for significant change in parameter, and p-value <0.001 is highly significant change in tested parameter.

DISCUSSION

Oxidative stress, dyslipidemia, diabetes mellitus type-2, cigarette smoking are major etiological factors for coronary artery disease. Niacin is commonly used drug which inhibit lipoprotein lipase activity, so lesser formation of free fatty acids will be available which are main sources of TG-rich lipoproteins (VLDL) formation. Lesser amount of VLDL lead to lesser synthesis of LDL particles which are rich in cholesterol. In our results Niacin 2 grams daily intake for two months decreased LDL-cholesterol about 13.9 % which is highly significant changes. HDL-cholesterol in this group increased about 16.2 % which is again highly significant change. Zhu et al. [10] and Cao et al. [11] proved same results when they used 2 grams of Niacin in 66

hyperlipidemic patients, but Yao et al. [12] observed lesser effects of Niacin on HDL cholesterol, i.e. only 4.4% increase in HDL cholesterol. Hung et al. [13] explained different mechanisms of hypolipidemic response of Nicotinic acid on persons with different genetic code. One of the favorable mechanisms for patients with CAD they described is fibrinolytic activity of Niacin. In our results Jujube fruit decreased LDL cholesterol is 7.9 mg/dl, which is significant change in the parameter. HDL cholesterol is not increased significantly in our results with p-value of >0.05. Tan et al. [14] and Tripathi et al. [15] observed same reason of Jujube on LDL and HDL-cholesterol, which augment our results. Tschesche et al. [16] observed more effects of Jujube as we observed in low density lipoprotein cholesterol. Um et al. [17] proved that LDL cholesterol is much decreased as compared to our results. Kang et al. [18] observed too less effects of Jujube fruit in 5 hyperlipidemic patients. This difference in two studies is obviously due to their small sample size, i.e. they tried herb only on five hyperlipidemic patients, while we tried in 30 hyperlipidemic patients. Johanson M, et al. [19], Jogiyaal M, et al. [20], Lufersa T, et al. [21] explained and advised to use medicinal plants with caution as these agents interact with other allopathic medications and enhance or reduce their metabolism causing toxicity or failure in other therapeutic considerations.

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