Annals of Agricultural & Crop Sciences

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Austin Publishing Group

Research Article

Therapeutic Considerations of Pakistani Fruits

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Received: July 23, 2019; **Accepted:** August 23, 2019; **Published:** August 30, 2019

Abstract

Study showed the co-treatment of Z. jujuba extract ameliorates ethanol-induced memory deficits, both in the acquisition process and retrieval process of spatial memory performance in rats. The improvement is attributed to the antioxidant properties of flavonoids present in the extract. The effects of dietary fats on the risk of Coronary Artery Disease (CAD) have traditionally been estimated from their effects on LDL cholesterol. Fats, however, also affect HDL cholesterol, and the ratio of total to HDL cholesterol is a more specific marker of CAD than is LDL cholesterol. 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 2017 to February 2018 at Jinnah Hospital Lahore. Sixty participants were enrolled of both gender male and female patient's 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 ± SEM were analyzed biostatistically. Group-I that 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: CAD; Hyperlipidemia; Prevention; Fruits; Oxidative stress

Introduction

The effects of diet on HDL cholesterol. There is a wealth of observational, mechanistic, and genetic evidence that increasing the concentration of HDL cholesterol through diet will lower the risk of CAD. In addition, a study with gemfibrozil showed that increasing the concentration of HDL cholesterol lowers the risk of CAD. In fact, the ratio of total to HDL cholesterol is considered more important than the total or lipoprotein cholesterol concentrations in estimating the risk of CAD. There is thus a need for coefficients that estimate the effect of fats on total: HDL cholesterol. This report presents such coefficients, which are based on the outcomes of selected studies published by investigators in 11 countries from 1970 through 1998. The effects of dietary fatty acids on plasma apolipoprotein (apo) B and apo A-I were also evaluated. Four drug groups are used to lower LDL particles and increase HDL in blood; i.e., statins, fibrates, niacin and bile acid binding resins. These drugs not only decrease the level of fats in blood, but they also decrease risk of atherosclerosis and its complications. Therefore, these 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, Fibric acids, 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. >2grams 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 if 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 amount 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 with dyslipidemia. Proved its hypolipidemic features. Results showed the fruits to be generally well tolerated, with potential favorable effects on serum lipid profile [7]. 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

Citation: Murad S, Seema, Ghaffar A, Murad JS, Abbasi GM and Mastoi AS. Therapeutic Considerations of Pakistani Fruits. Ann Agric Crop Sci. 2019; 4(2): 1048.

reduces risk of developing cardiac problems like CAD [8,9].

Patients and Method

This research work was conducted from November 2017 to February 2018. 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.

Statisical Analysis

Mean values ± 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 1.

Table 1: Showing pre and post treatment mean values with ± SEM and their significance change in parameters.

	LDL-c	HDL-c
Before treatment	G1= 210.1±2.11 G2= 198.8±2.17	37.9±1.91 38.6±2.19
After treatment	G1= 180.9±2.22 G2= 190.9±1.73	45.2±2.19 41.9±2.97
Change in mg/dl	G1= 29.2 G2= 7.9	7.3 3.3
Change in %	G1= 13.9 % G2= 4.0 %	16.20% 7.90%
p-value	G1= <0.001 G2= >0.05	<0.001 <0.01

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

Discussion

The use of total: HDL cholesterol implies that diet-induced decreases in HDL cholesterol increase CAD risk. Such a causal role for diet-induced changes in HDL cholesterol has not been proven in controlled clinical trials. However, results of prospective observational studies, controlled clinical trials with drugs, mechanistic studies, and genetic "experiments of nature" all strongly suggest that high concentrations of HDL cholesterol in the circulation help to prevent CAD and other cardiovascular diseases. 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. ZQ Zhu et al. and W Cao et al., proved same results when they used 2 grams of Niacin in 66 hyperlipidemic patients, but WB Yao et al., observed lesser effects of Niacin on HDL cholesterol, i.e. only 4.4% increase in HDL cholesterol [10-12]. Hung PG et al., explained different mechanisms of hypolipidemic response of Nicotinic acid on persons with different genetic code [13]. One of the favorable mechanism for patients with CAD they described is fibrinolytic activity of Niacin. In our results Jujube fruit, decreased LDL cholesterol is 7.9mg/dl, which is significant change in the parameter. HDL cholesterol is not increased significantly in our results with p-value of >0.05. Tan H et al. and Tripathi M et al., observed same reason of Jujube on LDL and HDL-cholesterol, which augment our results [14,15]. Tschesche R et al., observed more effects of Jujube as we observed in low density lipoprotein cholesterol [16]. Um S et al., proved that LDL cholesterol is much decreased as compared to our results [17]. KB Kang et al observed too less effects of Jujube fruit in 5 hyperlipidemic patients [18]. This difference in two studies are 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, Jogiyal M et al and Lufersa T et al., 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 [19-21].

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Ann Agric Crop Sci - Volume 4 Issue 2 - 2019
ISSN: 2573-3583 | www.austinpublishinggroup.com

Citation: Murad S, Seema, Ghaffar A, Murad JS, Abbasi GM and Mastoi AS. Therapeutic Considerations of Pakistani Fruits. Ann Agric Crop Sci. 2019; 4(2): 1048.