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Research Article

Plants and therapeutics: Interaction

Summary

Medicinal herbs are getting popularity due to their good compliance on the basis of their ethnic utilization and lesser side effects. Plasma lipids in body include, cholesterol, triglycerides, very low density lipoprotein-cholesterol, low density lipoprotein-cholesterol, and high density lipoprotein-cholesterol. High levels of LDL-cholesterol and lower levels of HDL-cholesterol may cause oxidation in plasma leading to formation of atherogenic plaques which are main etiological factors for development of Coronary Artery Diseases (CAD). Many hypolipidemic herbs are being used to prevent CAD. We have used AJWAIN, Alsi separately and in combination to observe their hypolipidemic potential. Study was conducted at Jinnah Hospital Lahore-Pakistan from March 2015 to July 2015. One hundred hyperlipidemic patients were selected from lipid research clinic of Jinnah Hospital, Lahore-Pakistan, and approved written consent was taken from all patients. They were divided in four equal groups comprising 25 patients in each group. Group-I was treated by AJWAIN for three months, Group-II was treated by ALSI, Group-III was treated by AJWAIN plus Alsi for the period of three months. After three months therapy it was observed that AJWAIN reduced LDL-cholesterol 23.77mg/dl and increased HDL-cholesterol 3.3mg/dl. ALSI reduced LDL-cholesterol 7.5mg/dl and increased HDL-cholesterol 5.3mg/dl. Whereas combination of both agents decreased LDL-cholesterol 16.1mg/dl and increased HDL-cholesterol 6.6mg/dl in three months therapy. It was concluded from this research work that ALSI and AJWAIN given separately or in combination, have good enough potential to reduce LDL-cholesterol but are less potent effect on HDL-cholesterol in hyperlipidemic patients.

Introduction

Various heart diseases are being treated by nutraceuticals; like vitamins and herbs. Oxidation of LDL particles are major cause of Coronary Artery Disease (CAD). High plasma lipid levels may be first step to sudden development of CAD, which may lead to morbidity and moratlity due to heart attack. To prevent development of CAD, it is uttermost important that plasma lipid levels remain normal. Various drugs are used for prevention of dyslipidemia in conventional method of Therapeutics, but their adverse effects have made them 'DRUGS OF LOW COMPLIANCE' in allopathic therapeutic discipline of medical sciences [1-3]. Herabal medications are going to replace scientifically proved allopathy related hypolipidemic drugs. Ajwain and Alsi are herbs having hypolipidemic potential in primary and secondary Hyperlipidemia with negligible adverse effects [4]. Ajwain seed analysis has revealed it to contain fiber (11.9%), carbohydrates (38.6%), tannins, glycosides, moisture (8.9%), protein (15.4%), fat (18.1%), saponins, flavone and mineral matter (7.1%) containing calcium, phosphorous, iron and nicotinic acid [5]. Antihyperlipidemic effect of Ajwain seed has been obtained in human beings. It was assessed that Ajwain powder at a dose rate of 2g/kg body weight and its equivalent methanol extract were extensively effective in lipid lowering action by decreased total cholesterol, LDL-cholesterol, triglycerides and total lipids [6]. Hepatic free radical stress causes hepatotoxicity which can be controlled by using Ajwain extract, because it decreases hepatic levels of lipid peroxides [7]. Antiplatelet-Aggregatory experiments in vitro with blood from human volunteers, it showed that a dried ethereal extract of Ajwain seeds, inhibited aggregation of platelets induced by arachidonic acid, collagen and epinephrine [8]. Flax or ALSI has been suggested to protect against cardiovascular disease (CVD). A number of mechanisms have been proposed by which flax may exert its beneficial effects on the cardiovascular system, i.e. reducing serum cholesterol, platelet aggregation, inflammatory markers, and improving glucose tolerance [9]. Flaxseeds cause adhesion of WBC with interior endothelial walls of blood vessels, so plaques are not able to adhere with endothelial walls, reducing risk of development of coronary artery disease [10]. Flaxseeds powder is rich in Omega-3 fatty acids and the alpha lenolenic acid present in the seeds is beneficial for the general inflammation due to morbid obese, and prevent atherosclerosis [11,12].

Patients & Methods

Research was done at Jinnah Hospital, Lahore-pakistan from March to July 2015. One hundred hyperlipidemic patients were selected after written and approved consent from all patients. Inclusion criteria was age limit of 17 to 65 years age of both gender. Diabetic, alcoholics, cigarette smokers, patients of peptic ulcer, thyroid disease, and with renally or hepatically impaired were excluded from the study. They were

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divided in four groups. Group-I was advised to take 10 grams of Ajwain in three divided doses for the period of three months. Group-II was on 10 grams of Alsi in divided doses for three months. Group-III was directed to take 10 grams of Ajwain and 10 grams of Alsi combinely in three equally divided doses for three months. Group-IV was on placebo to take three capsules (containing grinded wheat) thrice daily for the period of three months. Their base line lipid profile at day-0 was determined by conventional methods of estimation. They were advised to visit lipid research clinic of the hospital fortnightly. After three months their lipid profile was estimated and change in LDL-cholesterol and HDL-cholesterol was compared. Data were expressed as the mean ± Standard Diviation and "t" test was applied to determine statistical significance as the difference. A probability value of <0.05 was considered as non-significant and P<0.001 was considered as highly significant change in the results when pre and post-treatment values were compared.

Results

After three months when change in LDL-cholesterol and HDL-cholesterol was compared, following changes were seen. Their biostatistical significance is self explainatory shown in following Table 1.

Table 1: Effects of AJWAIN, ALSI, AJWAIN plus ALSI on HDL-c and LDL-c in HYPERLIPIDEMIC patients with PLACEBO effects and their significance shown as p-value.

Drug	Parameter	Before	After	Change mg/dl	% change	p-value
AJWAIN (n=24)	LDL-c	231.67±2.11	207.96±1.98	23.77	10.3	<0.01
	HDL-c	43.65±1.09	46.99±1.08	3.3	7.6	<0.01
ALSI (n=22)	LDL-c	207.50±1.11	200.02±1.11	7.5	3.6	>0.05
	HDL-c	33.33±1.61	38.60±2.10	5.3	15.9	<0.01
AJWAIN+ALSI (n=23)	LDL-c	204.11±1.04	188.01±2.05	16.1	7.9	<0.01
	HDL-c	33.10±2.22	39.71±1.11	6.6	19.9	<0.01
PLACEBO (n=25)	LDL-c	201.97±2.10	198.82±1.91	3.2	1.6	>0.05
	HDL-c	33.98±1.99	33.99±1.76	0.0	0.0	>0.05

Key: P-value <0.01= significant, p-value >0.05 = non-significant changes in lipid profile. HDL-c and LDL-c values are measured in milligrams per milliliter. 'n' written along with drug group of patients indicates number of patients in tested and placebo group.

Discussion

Low density lipoprotein cholesterol (LDL-C) is essential factor to cause oxidation and atherosclerosis in systemic circulation leading to development of coronary artery disease (CAD) which may be morbid or mortal. High density lipoprotein cholesterol (HDL-C) is known as GOOD CHOLESTEROL, and its high concentration in plasma is good indicator for prevention of atherosclerosis or CAD. Herbal medications are now a days replacing allopathic hypolipidemic drugs due to lesser adverse effects and good patient compliance. We have tried to compare hypolipidemic potential of herbal medicines AJWAIN, ALSI separately and when given in combination. Ten grams of Ajwain when used for three months, LDL-C in 24 hyperlipidemic patients reduced from 231.67±2.11 to 207.96±1.98mg/dl which is 10.3 % reduction in the parameter. HDL-C increased from 43.65±1.09 to 46.99±1.08mg/dl. These results are matched with results of Nagalakshmi S, et al., [13] and Kumari KS and Prameela M [14], who proved that Ajwain has more hypolipidemic potential than Alsi. Alsi in our results reduced LDL-C from 207.50±1.11 to 200.02±1.11mg/dl which is approximately 3.6 % reduction in the parameter. HDL-C increased was about 3.6 %. These results match with Chen ZY [15-17], who observed same changes in HDL-cholesterol, but they proved lesser reduction in LDL-cholesterol i.e. only 2%. This contrast may be due to ethnic related genetic variation in hyperlipidemias in different population of the world, which needs more elaborative research work. When Ajwain and Alsi were administered in 23 hyperlipidemic patients LDL-cholesterol reduction was 7.9 % and rise in HDL-cholesterol was 19.9 % and these changes match with results of study conducted by Srivastava KC [15]. He proved and explained about so much increase in HDL-cholesterol by using Ajwain and Alsi combinely that synergetic effect of two herbal medicines are conventional on two different parameters of lipid profile. Ishikawah T, et al., [16], have described change in inter-drug response may be observed by combination of two herbal drugs having same hypolipidemic potential due to same active ingredients. Juhad A, et al., [18], proved too much reduction in LDL-cholesterol when 30 grams of Ajwain and 15 grams of Alsi was used in 111 male hyperlipidemic patients. He proved 20.91% reduction in LDL-cholesterol and 33.12% increase in HDL-cholesterol. These contrasts in two results are because concentration of both drugs was high and sample size was good enough to get much change in results. Feethasee K, et al., [19] and Hingerr U, et al., [20], have augmented view point of Fulturu J, et al., [21], that drug drug interaction in herbal combined medication always and almost cause synergetic or potentiating of response. Junagare V, et al., [22], explained that scavenger activity of chemical contents of plants have hypolipidemic actions with lot of side effects, so these should be used with caution in persons who are already on any other medications.

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