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ЛЕЧЕБНЫЕ РАСТЕНИЯ ПАКИСТАНА: ЧУДО В МЕДИЦИНСКОЙ НАУКЕ

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Реферат. Холестерин плазмы является одним из ведущих факторов риска в развитии атеросклероза. Существует «плохой» холестерин (липопротеины низкой плотности) и «очень плохой» холестерин (окисленные липопротеины низкой плотности). Окисленные липопротеины низкой плотности без ограничения накапливаются в макрофагах при захвате соответствующими рецепторами (например, CD36 и SR-A) и способны дифференцировке пенных клеток. Продукция оксидантов, которые окисляют липопротеины низкой плотности, является критическим этапом в синтезе «очень плохого холестерина». **Цель** – провести оценку гиполлипидемического потенциала двух лекарственных растений. **Материал и методы.** Данное исследование является слепым плацебоконтролируемым. Оно проводилось в клинике Джиннах в Лахоре. Сроки проведения – с января по июнь 2018 г. Было отобрано 75 пациентов с установленной первичной или вторичной гиперлипидемией в возрасте от 17 до 65 лет. Пациенты были разделены на 3 группы (группа I, группа II, группа III), по 25 человек в каждой группе. Все базовые данные липидного профиля участников были получены до начала приема лекарств. Пациентам группы I было рекомендовано принимать по 10 г льняных семян 3 раза в день после еды. Пациентам группы II было рекомендовано принимать семена айвана по 10 г 3 раза в день после еды в течение 2 мес. Пациентам группы III были назначены плацебо-капсулы, содержащие измельченный рис, по одной капсуле после каждого приема пищи. Всем участникам было рекомендовано принимать эти лекарства в течение 8 нед. Липопротеины низкой плотности и липопротеины высокой плотности определялись в лаборатории клиники. **Результаты и их обсуждение.** Прием льняных семян в течение 2 мес привел к уменьшению содержания липопротеинов низкой плотности с (195,11±2,11) мг/дл до (190,22±3,11) мг/дл, что является статистически значимым. Липопротеины высокой плотности повысились с (34,53±1,65) мг/дл до (38,97±2,29) мг/дл, что также является значимым изменением. В течение двух месяцев приема семян айвана липопротеины низкой плотности снижались с (201,51±2,62) мг/дл до (197,11±2,66) мг/дл, что также статистически значимо. Содержание липопротеинов высокой плотности при приеме семян айвана увеличилось с (36,97±3,32) мг/дл до (37,45±1,87) мг/дл, что не было статистически значимо. **Выводы.** Данное исследование показало, что льняное семя оказывает большее влияние на липопротеины высокой плотности, в то время как семена айвана оказывают минимальное влияние на этот параметр.

Ключевые слова: холестерин, окисленные липопротеины низкой плотности, семена льна, семена айвана.

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PAKISTANI MEDICINAL PLANTS: MIRACLE IN MEDICAL SCIENCE

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Abstract. Internal, plasma cholesterol is one of several clear risk factors in the development of atherosclerosis. There's «bad» cholesterol, low density lipoproteins, and then there's «really bad» cholesterol, oxidized low density lipoproteins. Oxidized low density lipoproteins are accumulated without restriction by macrophages, captured by scavenger receptors (e.g., CD36 and SR-A) and promotes differentiation to foam cells. This indicates that the generation of oxidants that oxidized low density lipoprotein is a critical step in the production of really bad cholesterol. **Aim.** This study was conducted to see hypolipidemic potential of two medicinal herbs. **Material and methods.** The research work was single blind placebo-controlled, conducted at Jinnah Hospital, Lahore It was conducted from January 2018 to June 2018. 75 already diagnosed primary and secondary hyperlipidemic patients were selected with age range from 17 to 65 years. All patients were divided in three groups (group I, group II, group III), 25 in each group. All participant's baseline lipid profile data were taken and filed in specifically designed Performa, at start of taking medicine. 25 patients of group I were advised to take 10 grams of Flaxseeds in three divided doses after meal. 25 patients of group II were advised to take Ajwain seeds 10 grams in three divided doses after each meal for two months. 25 patients of group III were provided placebo capsules, (containing grinded rice), taking one capsule after each meal. All participants were advised to take these medicines for eight weeks. Their low density lipoproteins – cholesterol, and high density lipoproteins – cholesterol was determined at the hospital laboratory. **Results and discussion.** In two months therapy by Flaxseeds decreased low density lipoproteins – cholesterol from (195,11±2,110) mg/dl to (190,22±3,11) mg/dl, which is significant statistically. High density lipoprotein was increased from (34,53±1,65) mg/dl to (38,97±2,29) mg/dl, which is also significant change. In two months therapy by AJWAIN, low density lipoprotein-c reduced from (201,51±2,62) mg/dl to (197,11±2,66) mg/dl, which is significant statistically. High density lipoproteins – cholesterol increased by Ajwain from (36,97±3,32) mg/dl to (37,45±1,87) mg/dl, which is insignificant statistically. **Conclusion.** It was concluded from this study that Flaxseeds have more effect on high density lipoproteins-c but Ajwain has lowest effect on this parameter.

Key words: cholesterol, oxidized low density lipoproteins, Flaxseeds, Ajwain seeds.

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Introduction. Low density lipoproteins (LDL) is bad because it enables excess cholesterol to build up in the blood [1]. Flaxseed inhibits the production of pro-inflammatory cytokines, eicosanoids, cytokines and platelet-activating factor derived from arachidonic acid (an omega-6 fatty acid) and thus reduces inflammatory responses. One way that Alpha Linolenic Acid helps the heart is by decreasing the ability of platelets to clump together, a reaction involved in the development of atherosclerosis (hardening of the arteries), it acts as natural aspirin [2]. Flaxseed helps to lower high blood pressure, clears clogged coronaries like a sweeper, lowers high blood cholesterol, bad LDL cholesterol and triglyceride levels and raises good high density lipoproteins (HDL) cholesterol. Intake of flaxseeds has also been shown to decrease the ratio of LDL to HDL cholesterol in several human studies and to increase the level of apolipoprotein A1, which is the major protein found in HDL cholesterol. Flaxseeds prevent clot formation in arteries, which may result in strokes, heart attacks and thrombosis. Omega-3 Fatty acids present in Flaxseed appear to enhance the mechanical performance and electrical stability of the heart and to protect against fatal arrhythmias [3–7]. Trachyspermum

ammi, has been proven to possess various pharmacological activities like antifungal, antioxidant, antimicrobial, antinociceptive, cytotoxic, hypolipidemic, antihypertensive, antispasmodic, broncho-dilating actions, antilithiasis, diuretic, abortifacient, antitussive, nematicidal, anthelmintic and antifilarial. Further, studies reveal the presence of various phytochemical constituents mainly carbohydrates, glycosides, saponins, phenolic compounds, volatile oil (thymol, γ -terpinene, para-cymene, and α - and β -pinene), protein, fat, fiber and mineral matter containing calcium, phosphorous, iron and nicotinic acid. These studies reveal that T. ammi is a source of medicinally active compounds and have various pharmacological effects; hence, it is encouraging to find its new therapeutic uses [7–9]. The constituents of the seed of Ajwain included carbohydrates (38,6%), fat (18,1%), protein (15,4%), fiber (11,9%), tannins, glycosides, moisture (8,9%), saponins, flavone, and mineral matter (7,1%) containing calcium, phosphorous, iron, cobalt, copper, iodine, manganese, thiamine, riboflavin, and nicotinic acid [10, 11]. Antiplatelet-aggregatory experiments in vitro with blood from human volunteers, it that a dried ethereal extract of Ajwain seeds, inhibited aggregation

Showing effects of Ajwain before and after treatment with its statistical significance in group II patients (n=24)

Parameter	At start	At end	Diff	p-value
LDL-c	201,51±2,62	197,11±2,66	4,4	<0,01
HDL-c	36,97±3,32	37,45±1,87	0,5	>0,05

Key: all values are measured in mg/dl; LDL-c= low density lipoprotein cholesterol, HDL-c= high density lipoprotein cholesterol; p-value <0,01 stands for significant change; p-value <0,05 stands for non significant change; n stands for sample size.

of platelets induced by arachidonic acid, collagen and epinephrine [12]. Antihyperlipidemic effect of Ajwain seed has been proved by researchers. It was assessed that Ajwain powder and its equivalent methanol extract were extensively effective in lipid lowering action by decreased total cholesterol, LDL-cholesterol, triglycerides and total lipids [13–16].

Patients & method. The research work was single blind placebo-controlled, conducted at Jinnah Hospital, Lahore from January 2018 to June 2018. Seventy five already diagnosed primary and secondary hyperlipidemic patients were selected with age range from 17 to 65 years. Exclusion criteria were, diabetes mellitus, cigarette smoking/alcohol addictive patients, peptic ulcer disease, hypothyroidism, kidney dysfunction, any heart disease and liver disease. All patients were divided in three groups (group I, group II, group III), 25 in each group. Their baseline lipid profile data was taken and filed in specifically designed Performa, at start of taking medicine. Twenty five patients of group I were advised to take 10 grams of Flaxseeds in three divided doses after meal. Twenty five patients of group II were advised to take Ajwain seeds 10 grams in three divided doses after each meal for two months. Twenty five patients of group III were provided placebo capsules, (containing grinded rice), taking one capsule after each meal. All participants were advised to take these medicines for eight weeks. All participants were called fortnightly for their query and follow up. Their LDL-cholesterol, and HDL-cholesterol was determined at the hospital laboratory. After two months therapy results were compared and data were expressed as the mean ± Standard Deviation 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<0,01 was considered as significant change in the results when pre and post-treatment results were compared.

Results. When results were compiled and statistically analyzed it was observed that Flaxseeds and Ajwain decreased LDL-cholesterol, and increased HDL-cholesterol significantly as compared to placebo therapy. Before treatment and after treatment values and results are shown in table 1, 2, 3.

Table 1

Showing effects of Placebo therapy before and after treatment with its statistical significance in group III patients (n=25)

Parameter	At start	At end	Diff	p-value
LDL-c	188,11±1,06	187,77±2,51	0,3	>0,05
HDL-c	30,78±2,65	31,39±1,66	0,6	>0,05

Table 2

Showing effects of Flaxseeds before and after treatment with its statistical significance in group I patients (n=22)

Parameter	At start	At end	Diff	p-value
LDL-c	195,11±2,11	190,22±3,11	4,9	<0,01
HDL-c	34,53±1,65	38,97±2,29	4,4	<0,01

Discussion. Reactive oxygen species (ROS) and nitric oxide (NO) are normal products of a healthy vascular system. ROS are formed as a by-product of the normal metabolism of oxygen and are involved in intracellular signalling and in ATP generation in all cells. NO, produced by endothelial cells, inhibits monocyte adhesion, reduces vascular tone and inhibits platelet aggregation. However, several factors, including inflammation, can dramatically increase the production of ROS. Superoxide (O_2^-), hydrogen peroxide (H_2O_2), and hydroxyl radical (OH^\bullet) are powerful oxidants associated with the phagocytic oxidative burst. These molecules damage lipids, proteins, RNA, and DNA, and transform already dangerous LDL into its most lethal form. Or they can react with NO to produce peroxynitrite ($ONOO^-$) another damaging ROS. The greater prevalence of CAD in the Indo-Pakistan population is likely to be due to a greater susceptibility to the metabolic syndrome; around a third to a half of these middle-aged men and women, respectively, were classified as positive for the metabolic syndrome using current criteria. The greater prevalence of definite CAD in men is largely due to the effect of smoking exposure, which owing to its substantially higher prevalence in men, overwhelms the impact of the greater prevalence of the metabolic syndrome in women. Angina is the most common symptom of CAD. Flaxseeds and Ajwain are thought to inhibit these pro-inflammatory effects in human body. In our results using 10 grams of Ajwain by 24 hyperlipidemic patients for the period of two months, LDL-c reduced from (201,51±2,62) mg/dl to (197,11±2,66) mg/dl. Difference in pre and post treatment values is 4,4 mg/dl. Increase in HDL was 0,5 mg/dl, which is non significant change in pre and post treatment values. In our study Flaxseeds decreased LDL-c from (195,11±2,11) mg/dl to (190,22±3,11) mg/dl in two months therapy by 10 grams Flaxseeds used by 22 hyperlipidemic patients. Difference in pre and post treatment values is 4,9 mg/dl in this parameter. HDL was increased from (34,53±1,65) mg/dl to (38,97±2,29) mg/dl. Difference in percentage when measured/calculated it was 4,4 mg/dl which is significant biostatistically with p-value <0,01. These results match with results of study conducted by Y. Cho et al. [17] who proved almost same effects on two lipid profile parameters ie; LDL-cholesterol and HDL-cholesterol. S. Chaudhury [18] proved same changes in LDL-

cholesterol and HDL-cholesterol which also support our results biostatistically. S. Nagalakshmi et al. [19] explained that all herbs with their therapeutically medicinal potential will work when used in high amount and for long period. D. Jenkins et al. [20] described that Flaxseeds or its oil preparation have same effects on all parameters of lipid profile. On comparison between statins and herbal medicine having hypolipidemic effects. D.S. Kelley et al. [21] explained that there is too much difference in hypolipidemic effects of allopathic medication and herbs, having less potent hypolipidemic features of herbal medications. F. Shahidi, H. Miraliakba [22] proved that all parameters of lipid profile including total, LDL-cholesterol, HDL-cholesterol, VLDL-cholesterol, IDL and triglycerides are affected by Flaxseeds oil preparations. They have focused on inhibition of enterohepatic circulation of bile acids and explained that due to lack of bile acid pool in gall bladder, hepatocytes start to synthesize bile acids instead of cholesterol synthesis. Many scientist proved that if used Flaxseeds with dietary restrictions and change in sedentary life style, HDL-cholesterol will increased surely. They explained that if only one parameter of lipid profile ie; HDL-cholesterol is increased, all other parameters in ratio will obviously be reduced leading to lesser chances of development of CAD.

Transparency of the study. *The study did not have sponsorship. The authors are solely responsible for the provision of the final version of the manuscript for publication.*

Declaration of financial or other relationships. *All authors participated in the conception and design of the study and in the writing of the manuscript. The final version of the manuscript was approved by all the authors. The authors did not receive a fee for the study.*

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