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# COMMUNITY HEALTH ISSUES AND USE OF ALTERNATIVE CHEMICAL FORMULA RELATED AGENTS AS THERAPY

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**ABSTRACT**

The most widely recognized of the metabolic risk factors are atherogenic dyslipidemia, elevated blood pressure, and elevated plasma glucose. Individuals with these characteristics commonly manifest a prothrombotic state and a pro -inflammatory state as well. Atherogenic dyslipidemia consists of an aggregation of lipoprotein abnormalities including elevated serum triglyceride and apolipoprotein B (apoB), increased small LDL particles, and a reduced level of HDL cholesterol (HDL-C). The metabolic syndrome is often referred to as if it were a discrete entity with a single cause. Available data suggest that it truly is a syndrome, ie, a grouping of ASCVD risk factors, but one that probably has more than one cause. Regardless of cause, the syndrome identifies individuals at an elevated risk for ASCVD. The magnitude of the increased risk can vary according to which components of the syndrome are present plus the other, non-metabolic syndrome risk factors in a particular person. Design and Place of conduction: The research work was single blind placebo-controlled, conducted at Jinnah Hospital, Lahore Research time: It was conducted from April 2021 to October 2021. Number of patients and their Age: Seventy five already diagnosed primary and secondary hyperlipidemic patients were selected with age range from 17 to 65 years. Exclusion criteria: 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. Proforma for patients: Their baseline lipid profile data were taken and filed in specifically designed Performa, at start of taking medicine. Patients group division: 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. Follow-up period: All participants were called fortnightly for their query and follow up. Their LDL-cholesterol and HDL-cholesterol was determined at the hospital laboratory. Results: In two months therapy by Flaxseeds decreased LDL-cholesterol from 195.11±2.11 mg/dl to 190.22±3.11 mg/dl, which is significant statistically. HDL was increased from 34.53±1.65 mg/dl to 38.97±2.29 mg/d, which is also significant change. In two months therapy by AJWAIN, LDL-c reduced from 201.51±2.62 mg/dl to 197.11±2.66 mg/dl, which is significant statistically. HDL-cholesterol increased by Ajwain from 36.97±3.32 mg/dl to 37.45±1.87 mg/dl, which is insignificant statistically.

**Keywords:** community Health, atherogenic, dyslipidemia.

## INTRODUCTION

The metabolic syndrome is a constellation of interrelated risk factors of metabolic origin—metabolic risk factors—that appear to directly promote the development of atherosclerotic cardiovascular disease (ASCVD).1 Patients with the metabolic syndrome also are at increased risk for developing type 2 diabetes mellitus. Another set of conditions, the underlying risk factors, give rise to the metabolic risk factors. In the past few years, several expert groups have attempted to set forth simple diagnostic criteria to be used in clinical practice to identify patients who manifest the multiple components of the metabolic syndrome. These criteria have varied somewhat in specific elements, but in general they include a combination of both underlying and metabolic risk factors[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 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 commonly known as 'Ajwain' is distributed throughout India and is mostly cultivated in Gujarat and Rajasthan. The fruit possesses stimulant, antispasmodic and carminative properties and is used traditionally as an important remedial agent for flatulence, atonic dyspepsia, diarrhea, abdominal tumors, abdominal pains, piles, and bronchial problems, lack of appetite, galactogogue, asthma and amenorrhoea. Medicinally, it 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 of platelets induced by arachidonic acid, collagen and epinephrine[12]. The seeds contain 2–4.4% brown colored oil known as ajwain oil. The main component of this oil is thymol, which is used in the treatment of gastro-intestinal ailments, lack of appetite and bronchial problems. The oil exhibits fungicidal,[2] antimicrobial [3] and anti-aggregatory effects on humans.[4] Ajwain is a traditional potential herb and is widely used for curing various diseases in humans and animals. The fruit possesses stimulant, antispasmodic and carminative properties. It is an important remedial agent for flatulence, atonic dyspepsia and diarrhea. [5] The seed of ajwain is bitter, pungent and it acts as anthelmintic, carminative, laxative, and stomachic. It also cures abdominal tumors, abdominal pains and piles.[6] Seeds contain an essential oil containing about 50% thymol which is a strong germicide, anti-spasmodic and fungicide. Thymol is also used in toothpaste and perfumery[13].

**PATIENTS & METHOD**

The research work was single blind placebo-controlled, conducted at Jinnah Hospital, Lahore from April 2021 to October 2021. 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 by using new version of Statistical Package for Social Sciences, 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 and 3.

**TABLE 1** 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 |

**TABLE 2** 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 |

**TABLE 3** 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 |

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.

**DISCUSSION**

The metabolic syndrome has received increased attention in the past few years. This statement from the American Heart Association (AHA) and the National Heart, Lung, and Blood Institute (NHLBI) is intended to provide up-to-date guidance for professionals on the diagnosis and management of the metabolic syndrome in adults. Flaxseeds and Ajwain are thaught to inhibit these pro-inflammatory effects in human body. In our study Flaxseeds decreased LDL-c from 195.11±2.11 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 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 Jenkins D et al[14] who proved almost same effects on two lipid profile parameters ie; LDL-cholesterol and HDL-cholesterol. Kelley DS et al.[15] described that Flaxseeds or its oil preparation have same effects on all parameters of lipid profile. On comparision between statins and herbal medicine having hypolipidemic effects, Shahidi F and Miraliakbari[16] explained that there is too much difference in hypolipidemic effects of allopathic medication and herbs, having less potent hypolipidemic features of herbal medications. Rodriguez-Leyva et al[17] 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. Tzang BS et al[18] proved that if used Flaxseeds with dietry restrictions and change in sedentary life style, HDL-cholesterol increased from 33.54 mg/dl to 49.01 mg/dl. 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. According to Prasad K[19] anti-inflammatory effects of Flaxseeds play key role in prevention of atherosclerosis and CAD. Arjmandi B et al[20] have same view point regarding major role of high density lipoprotein cholesterol that in formation of atherosclerotic plaques and coronary artery disease, ie; if HDL-cholesterol is high there is healthy/required/ ratio of LDL:HDL. Cho Y et al[21] have mentioned that if sedentary life style is changed by hyperlipidemic patients, very small but regular amount of Flaxseeds are required to stay at preventive step of coronary artery disease due to Hyperlipidemia. 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. Chodhury S[22] proved same results in their study. They proved significant change in LDL-cholesterol but HDL-cholesterol was not much increased by taking Ajwain's oily preparations. Srivastava KC[23] proved in his study that high LDL-cholesterol has close concerned with pro-inflammatory responses leading to platelet aggregation. Anilakumar KC et al[24] proved lesser effects of Ajwain on LDL-cholesterol as compared to good cholesterol ie; HDL-cholesterol. This contrast is obviously linked with amount of drug used and duration of Ajwain intake by small number of patients as they used 4 grams of Ajwain in 10 hyperlipidemic patients for the period of one month. Chialva F et al[25] proved same changes in LDL-cholesterol and HDL-cholesterol which also support our results biostatistically. Singh G et al[26] explained that all herbs with their therapeutically medicinal potential will work when used in high amount and for long period. Furako G et al[26], Morat C et al[27], Yaltvov E et al[28] explained that Ajwain with its characteristic aromatic smell and pungent taste is widely used as a spice in curries. Its seeds are used in small quantities for flavoring numerous foods, as preservatives, in medicine and for the manufacture of essential oil in perfumery.[13] In Indian system of medicine, ajwain is administered for curing stomach disorders, a paste of crushed fruits is applied externally for relieving colic pains; and a hot and dry fomentation of the fruits is applied on chest for asthma.[19,20] T. ammi has been shown to possess antimicrobial,[21] hypolipidemic,[22] digestive stimulant,[23] antihypertensive, hepatoprotective, antispasmodic, broncho-dilating,[24] antilithiasis, diuretic,[25] abortifacient,[26] galactogogic,[27] antiplatelet-aggregatory,[28] antiinflammatory,[29] antitussive,[30] antifilarial,[31] gestroprotective,[32] nematicidal,[33] anthelmintic,[34] detoxification of aflatoxins,[35] and ameliorative effects.[36] Therapeutic uses of T. ammi fruits include; stomachic, carminative[37] and expectorant, antiseptic[38] and amoebiasis, antimicrobial.[39] Seeds soaked in lemon juice with Prunus amygdalus (badam) are given in curing amenhorroea[40] and it is also used as antipyretic, febrifugal and in the treatment of typhoid fever

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