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## RESEARCH ARTICLE

**FLAXSEEDS AND AJWAIN FOR PRIMARY HYPERLIPIDEMIA****Dr. Gulshan Ara Jalbani, Dr. Shaheena Hakro, \*Dr. Shah Murad, Dr. Khalid Niaz, Dr. Abdul Qudoos, Dr. Hafiz Moeen-Ud-Din, And Dr. Ajaz Fatima**

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**ABSTRACT**

Research work was single blind placebo-controlled, conducted at General Hospital, Lahore, Pakistan conducted from NOVEMBER 2015 to JANUARY 2016. 75 diagnosed primary hyperlipidemic patients were selected with age range from 20 to 60 years. 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, ie; 25 in each group. All participant's baseline lipid profile data were 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. Followup period: All participants were called fortnightly for their query and follow up. Their LDL-cholesterol, and HDL-cholesterol was determined at the hospital laboratory. In two months therapy by Flaxseeds decreased LDL-cholesterol 6.2 % and increased HDL-cholesterol 7.7 %. Ajwain reduced LDL-cholesterol 8.9 % and HDL-cholesterol increased 13.1 %. All changes are biostatistically significant with p-value of <0.01. Conclusion: It was concluded from the research that both Flaxseeds and Ajwain are effective in Primary Hyperlipidemia, if used for two months with specific concentrations.

**INTRODUCTION**

The risk of developing atherosclerosis increases as the total cholesterol level increases, even if the level is not high enough to be considered dyslipidemia<sup>1</sup>. Atherosclerosis can affect the arteries that supply blood to the heart causing coronary artery disease, those that supply blood to the brain causing cerebrovascular disease, and those that supply the rest of the body causing peripheral arterial disease. Therefore, having a high total cholesterol level also increases the risk of having a heart attack or stroke<sup>2-4</sup>. Having a low total cholesterol level is generally considered better than having a high one. However, having a very low cholesterol level may not be healthy either<sup>5</sup>. Flaxseed improves cholesterol profile. In a double-blind study of about 200 postmenopausal women, use of flaxseed at a dose of 40 g daily produced measurable improvements in cholesterol profile. It has been claimed that flaxseed also have a direct effect in helping to prevent atherosclerosis based on its lignan ingredients<sup>9</sup>. Ajwain has niacin and Thymol both have properties to keep the Heart in healthy condition. Ajwain has properties that improve nerve impulses and overall circulation within the heart. It is advised by researchers and physicians that have ajwain boiled in hot water on an empty stomach regularly to keep heart disease at bay<sup>10-13</sup>. Regular use of Ajwain reduces the water in the body thus works against

the salt ionic activity in the body so people who suffer with obesity must take the preparation of ajwain as it increases the metabolic rate and also pumps out the excess salts in the body<sup>14</sup>.

**MATERIAL & METHOD**

Specific set-up was designed at OPD of General Hospital, Lahore labeled as 'Lipid Research Clinic'. The research study was single blind placebo-controlled, conducted from November 2015 to January 2016. Seventy five primary patients were selected with age range from 20 to 60 years. Consent from all participants was taken on moral, ethics and legal grounds. 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, twenty five in each group.

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Their baseline values regarding LIPID PROFILE was taken and filed in Performa, at start of research work. 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, which were containing grinded rice, taking one capsule after each meal. All participants were advised to take these medicines for eight weeks. All participants were advised to visit clinic every 2 weeks for follow up. Their LDL-cholesterol, and HDL-cholesterol measurement was done at the hospital laboratory. After two months therapy results were compared and data were expressed as the mean  $\pm$  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

In 2 months therapy, Flaxseeds reduced LDL-cholesterol 12.5 mg/dl, HDL-cholesterol increase was 3.3 mg/dl. Ajwain reduced LDL-cholesterol in 2 months 18.7 mg/dl and increased HDL-cholesterol 6.3 mg/dl. In placebo group LDL-cholesterol reduction was observed 1.2 mg/dl and increase in HDL-cholesterol was 0.9 mg/dl. Change in mean values and significant changes are shown in table:

**Table 1:** showing effects of Flaxseeds, Ajwain and placebo before and after treatment with its statistical significance (Flaxseeds n=22, Ajwain n= 24, Placebo n= 25)

<u>Flaxseeds at-Day-0</u>	<u>Day-60</u>	<u>Change in mean value</u>	<u>Change in %</u>	<u>p-value</u>
LDL-c 200.50 $\pm$ 2.05 HDL-c 39.33 $\pm$ 1.77	188.02 $\pm$ 3.45 42.60 $\pm$ 2.51	12.5 3.3	6.2 7.7	<0.01 <0.01
<u>Ajwain at Day-0</u> LDL-c 210.67 $\pm$ 1.90 HDL-c 41.65 $\pm$ 1.68	Day-60 191.96 $\pm$ 2.30 47.99 $\pm$ 1.50	18.7 6.3	8.9 13.1	<0.01 <0.01
<u>Placebo at Day-0</u> LDL-c 190.97 $\pm$ 1.04 HDL-c 35.54 $\pm$ 2.08	Day-60 189.82 $\pm$ 2.88 36.39 $\pm$ 1.00	1.2 0.9	0.6 2.5	>0.05 >0.05

KEY: all parameter's values and change in mean values are measured in mg/dl. P-value  $<0.01$  stands for significant and p-value  $>0.05$  are showing non-significant changes. N stands for sample size.

## DISCUSSION

To reduce plasma cholesterol levels in order to reduce the risk of heart disease is main focus of medical researchers to control morbidity and mortality due to dyslipidemia. The high costs and side effects of hypercholesterolemia medications have led many people to search for alternate treatments. Flaxseeds and Ajwain are proved hypolipidemic agents in Pharmacognosy. Correlation of different herbal medicines and ethnic behaviours were cause to conduct this research work. In our results Flaxseeds reduced LDL-cholesterol 12.5 mg/dl, HDL-cholesterol increase was 3.3 mg/dl. Ajwain reduced LDL-cholesterol in 2 months 18.7 mg/dl and increased HDL-cholesterol 6.3 mg/dl. In placebo group LDL-cholesterol reduction was observed 1.2 mg/dl and increase in HDL-cholesterol was 0.9 mg/dl. Changes in LDL and HDL-cholesterol in tested group were significant statistically. These results match with results of study conducted by Arjmandi B et al<sup>15</sup> who proved that flaxseeds reduced 8.2 % LDL-cholesterol and HDL-cholesterol increased was 8.00 %. These results support our results. Parsad K<sup>16</sup> proved similar changes in LDL-cholesterol, triglycerides and HDL-cholesterol which also support our results biostatistically. Kelley DS et al<sup>17</sup> explained that all herbs are not therapeutically as effective as conventionally prescribed hypolipidemic drugs. Cho Y et al<sup>18</sup> described that Flaxseed's oil preparation have

same effects on all parameters of lipid profile including effect on VLDL and triglycerids as of Statins. Jenkins D et al<sup>19</sup> proved that Flaxseeds have more effect on low density lipoproteins but no effect or very response to increase HDL-cholesterol. This contrast in results may be that time required for HDL-C is more as compared to clearance of low density lipoproteins from plasma. Even statins require more time to increase HDL as compared to LDL particles. Nagalakshmi S et al<sup>20</sup> proved that Ajwain has both features ie to reduce LDL-cholesterol and to increase HDL-cholesterol. T zang BS et al<sup>21</sup> proved antihyperlipidemic effects of Ajwain in male and female patients suffering from primary as well as secondary to sedentary life style living individuals. Ishikawah T et al<sup>22</sup> described mechanism of Ajwain that it acts like Ispaghula husk, ie; it reduces enterohepatic circulation, converting hepatocytes to synthesize bile acids instead of cholesterol. Results proved by Murthy PS et al<sup>23</sup> are contradicting our results. They proved very small fraction of low density lipoproteins to reduce in 13 primary as well as secondary hyperlipidemic patients by taking 5 grams of Ajwain per day for two weeks. These contrasts in results are self explanatory as very small sample size, duration of drug intake and very low dose of Ajwain used in these patients.

## REFERENCES

1. Trompet S, Van Vliet P, de Craen AJ, et al. Pravastatin and CAD in the elderly. Results of the PROSPER study. *J Neurol*. 2010;257:85-90.
2. Wagstaff LR, Mitton MW, Arvik BM, Doraiswamy PM. Coronary Artery Disease and Hyperlipidemia: analysis of 60 case reports and review of the literature. *Pharmacotherapy* 2013;23:871-80.
3. Srivastava KC. Extract of a spice-omum (*Trachyspermum ammi*) shows antiaggregatory effects and alters arachidonic acid metabolism in human platelets. *Prostaglandins Leukot Essent Fatty Acids* 2011;33:16.
4. Feldman HH, Doody RS, Kivipelto M, et al. Randomized controlled trial of atorvastatin in mild to moderate hyperlipidemia. *Neurology* 2010;74:956-964.
5. Orsi A, Sherman O, Woldelessie Z. Simvastatin-associated memory loss. *Pharmacotherapy* 2011;21:767-9.
6. Chialva F, Monguzzi F, Manitto P, Akgül A. Essential oil constituents of *Trachyspermum copticum* (L.) and Lipid Metabolism. *J Essent Oil Res*. 2012;5:105-6.
7. Patenaude, A., Rodriguez-Leyva, D., Edel, A. L., Dibrov, E., et al., Bioavailability of  $\alpha$ -linolenic acid from flaxseed diets as a function of the age of the subject. *Euro. J. Clin. Nutri*. 2009;63:1123-1129.
8. Krishnamoorthy V, Madalageri MB. Bishop weeds (*Trachyspermum ammi*): An essential crop for north Karnataka. *J Med Aromat Plant Sci*. 2010;21:996-8.
9. Rodriguez-Leyva, D., Bassett, C. M., McCullough, R., Pierce, G. N., The cardiovascular effects of flaxseed and its omega-3 fatty acid, alpha-linolenic acid. *Can. J. Cardiol*. 2010;26:489-496.
10. Zomorodian K, Moein MR, Rahimi MJ et al., "Possible application and chemical compositions of flaxseed essential oils against food borne and nosocomial pathogens," *Middle-East Journal of Scientific Research* 2011;9(2): 239-45.
11. Singh G, Maurya S, Catalan C, de Lampasona MP, "Chemical constituents, antifungal and antioxidative effects of ajwain essential oil and its acetone extract," *Journal of Agricultural and Food Chemistry* 2004;52(11): 3292-96.
12. Anilakumar KR, Saritha V, Khanum F, Bawa AS. Ameliorative effect of ajwain extract on hexachlorocyclohexane-induced lipid peroxidation. *Food Chem Toxicol*. 2009;47:279-82.
13. Khajeh M, Yamini Y, Sefidkon F, Bahramifar N, "Comparison of essential oil composition of *Carum copticum* obtained by supercritical carbon dioxide extraction and hydrodistillation methods," *Food Chemistry* 2010;86(4):587-591.
14. Mohagheghzadeh A, Faridi P, Ghasemi Y, "Carum copticum Benth. & Hook., essential oil chemotypes," *Food Chemistry* 2007;100(3):1217-19.
15. Arjmandi B, Khan D, Juma S, et al. Whole flaxseed consumption lowers serum LDL-cholesterol and lipoprotein (a) concentrations in postmenopausal women. *Nutrition Research* 2011; 18(7):1203-14.
16. Prasad K. Hypocholesterolemic and antiatherosclerotic effect of flax lignan complex isolated from flaxseed. *Atherosclerosis* 2008;179(2):269-275.
17. Kelley, D. S., Siegel, D., Vemuri, M., Mackey, B. E., Flaxseeds improve fasting and postprandial lipid profiles in hyperlipidemic men. *Am. J. Clin. Nutr*. 2009;86:324-333.
18. Cho Y, Kwon E, Kim H, et al. Low trans structured fat from flaxseed oil improves plasma and hepatic lipid metabolism. *Food and Chemical Toxicology* 2009;47(7):1550-55.
19. Jenkins D, Kendall C, Vidgen E, et al. Health aspects of partially defatted flaxseed, including effects on serum lipids, and oxidative stress: a controlled crossover trial. *American Journal of Clinical Nutrition* 2010;69(3):395.
20. Nagalakshmi S, Shankaracharya NB, Naik JP, Rao LJM. Studies on chemical and technological aspects of ajowan (*Trachyspermum ammi* syn. *Carum copticum*) *J Food Sci Technol*. 2011;37:277-81.
21. Tzang, B. S., Yang, S. F., Fu, S. G., Yang, H. C., et al., Effects of AJWAIN on cholesterol metabolism. *Food Chem*. 2009;114:1450-55.
22. Ishikawah T, Sega Y, Kitajima J. Water-soluble constituents of ajowan. *Chem Pharm Bull*. 2011;49:840-4.
23. Murthy PS, Borse BB, Khanum H, Srinivas P. Inhibitory effects of Ajwain (*Trachyspermum ammi*) ethanolic extract on *A. ochraceus* growth and ochratoxin production. *Turk J Biol*. 2009;33:211-7.

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