

Studies on effect of Cumin extract on induced hyper cholesterolemic male rats

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ABSTRACT

In the present study, the effect of water extract of cumin on plasma lipids were studied in healthy male rats. The objective of the present research is to study the effect of extract of cumin on plasma lipids and lipoproteins in induced hyper cholesterolemic male rats. Various biochemical parameters such as triglycerides (TG), total cholesterol (TC), HDL-C and LDL-C were studied. The body weight of rats was measured before and end of the experiment.

The results of present study shows that water extract of cumin cause significant decrease of TC (pre-test 299±37.08, post-test 149.1±31, $p=0.017$) and LDL-C (pretest 153±14, post-test 0.12±8.7, $p=0.001$). While in case of feeding groups of water extract of cumin shows significant increasing levels of HDL-C (pre-test 77±13.1, post-test 120±18, $p=0.003$). No changes in the body weight of the rats were observed in exercised group. Significant changes were also noticed in rats treated with cumin extract.

Keywords: Hyper Cholesterolemic rats, cumin, plasma lipoproteins.

INTRODUCTION

Increasing of blood fat especially cholesterol is propounded as an important factor of aggravation of heart diseases. Now more than 100 million American suffering from increasing of blood cholesterol and about 50 million of them require remedy. In Iran 2 cities were selected, the fatality arised from various heart diseases. According to reported statistics of Tehran 13 zone, 8.8% of men and 12.7% of women were suffering from heart diseases in 1984. Metabolism manner and plasma lipids amount especially blood lipoprotein play an important role in appearing and aggravation of heart diseases. Therefore, a linear relation between cholesterol amount and fatality rate arised from coronary heart diseases. In the way, by increasing of total cholesterol amounting to 25 mg/dl, the fatality arised from this disease increased 12%, so with attention to direct relation at lipids with heart attack, the regulation of blood fats amount is

considered as an important factor in hearth and undoubtedly the habit to suitable exercise actively play on important role in this area. Many researches were done in this area.

Review of literature revealed that patients need medication but only 23% of them receive medicine. So in the present paper efforts were made to study effect of cumin extract on hyper cholesterolemic rats. (Rahmani, 1998; Kannar *et al.*, 2001; Marcus, 1997 and Ahmed and Sharma, 1999). The present paper reports the effect of cumin extract on induced hyper cholesterolemic rats.

MATERIALS AND METHODS

Test animals

For the purpose of present study, a total of 40 albino male rats were selected (25-45 gr weight).

Induction of hyper cholesterolemic condition

For induction of hyper cholesterolemic condition, the rats were fed with feed containing cornoil (5%), cholesterol (3%) and colic acid (0.6%).

Experimental Design

Animals were divided randomly into 4 groups namely dissolver, cumin (BPEA) and exercise + cumin (EE+BPEA). For all groups cumin was administrated in different ways for 6 days in each week for six weeks period. The weights of the animals were measured before and after each experiment. Various biochemical parameters were tested after end of experiment in each group. The obtained data was analyzed statistically and one way ANOVA was applied for analysis of the data.

RESULTS

The effect of cumin complementary and exercise groups were studied and serum lipids and lipoproteins density. ANOVA test indicates of this that there is significant difference between (before exercise) and post-test (after exercise) of total cholesterol and LDL ($P=0.001$). The total cholesterol levels in cumin +exercise group (EE+BPEA) was less than dissolver and exercise groups. A significant ($p=0.0001$) (EE+BPEA) decrease in total cholesterol was evident in (EE+BPEA) than other groups. HDL-C amount in dissolver and BPEA groups ($p<0.01$) and EE-BPEA group was significant in comparison to control ($p<0.05$). Administration of cumin to hyper cholesterolemic rats leads to increasing levels of HDL. A significant difference in LDL-C amount in under remedy groups by EE-BPEA was lesser than other groups. There is a significant difference was observed between dissolver groups with cumin consumption difference between dissolver and BPEA groups ($p<0.01$), dissolver and EE-BPEA ($p<0.05$) EE and BPEA ($p<0.01$) and EE and EE-BPEA ($p<0.05$) and cumin group and exercise + cumin ($p=0.032$) was shown significant changes insignificant changes in cholesterol levels in cumin consumption groups and cause increasing levels of HDL in comparison with other groups. LDL-C changes in different groups of study. LDL-C changes showed significant differences between dissolver groups with cumin consumption ($p=0.013$) dissolver with exercise +cumin ($p=0.044$), exercise +cumin ($p=0.007$) and exercise with exercise+cumin

($p=0.024$) LDL-C in comparison with dissolver and exercise and LDL decreasing in exercise +cumin group was more than dissolver and exercise groups.

DISCUSSION

The result of this study shows that, exercise after consuming cumin lead to significant decrease in plasma levels and LDL-C, although the difference is in significant with plasma density of TG and HDL-C the consumption of cumin extract is significant increase f HDL-C density and decrease of LDL-C. The result of present study correlate with the results of ravikiran and his colleagues and it was propounded that swimming for 4 weeks (6 day in a week) in 20,40 and 60 minutes make meaningful change in lipid profile including decreasing TC, TG and LDL-C density and increasing HDL-C density. Although decreasing of TG density did not observe in their study the decreasing levels of LDL-C because of probable oxidation Stress. In their study, exercising for 40 minute in a day cause decreasing of cholesterol levels that is similar to time exercising of present work. On the other hand exercising with high severity is incapable of creating significant changes in lipid profile. Threshold may also cause significant increase in HDL-C levels. Similar observations were also reported by Asha Devi and her colleagues.

Exercise did not have significant effect on LDL-C of levels in the rats. Van oovt and his colleagues did not report any significant results lipid profile after 8 months exercise courses. Consumed food can be another factor of non changing of lipoproteins. The finding of present work is agreement with in the work of Dhandapani and his colleagues. They reported that significant levels of TG and TC in diabetic rats. Although the significant decrease of LDL-C density was also observed by Dhandapani and colleagues. Furthermore cumin extract consumption cause increasing of HDL-C density .the decreasing effect of cumin on lipid may be as the result of direct decreasing in blood glucose.

Mela et al reported that in sufficient exercise stress is the reason of non changing of body weight. On the other hand in the present study results are contrary to Asha Devi and his

colleagues. Because in their study rats weight increased after 2 months. The main task that change energy balance during exercise is consumed energy at the moment of activity. Donnelly and his colleagues done by exercising without food limitation for more than 16 month non weight decreasing reported. Mohammadnia Ahmadi reported that nonexistence of food limitation introduced as one reason of none decreasing of

body weight of animals. American medicinal institute for keeping body weight is 60 minutes in a day with middle severity that can justify none meaningful decreasing of body. Furthermore the result of present work is in contrary with the work of Dhandapani et al and they reported increasing of body weight by cumin consumption. But in the present study, the animal's body is not increased in significant levels.

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