



EFFECT OF GRAPE SEED OIL ON THE PLASMA LEVELS OF TRIGLYCERIDE, CHOLESTEROL AND TOTAL PROTEIN IN PIGEONS

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ABSTRACT

Addition of 75% concentration of grape seed oil to pigeons ration will enhance its health status. An experiment was conducted to investigate the effect of grape seed oil on the levels of triglyceride, cholesterol and total protein in pigeon. Twenty five pigeons were divided into 5 groups each group contains 5 pigeons. The first group was considered as control group. The second group was given 10% concentration of grape seed oil. The third group was given 25% concentration of grape seed oil. The fourth group was given 50% concentration of grape seed oil. The fifth group was given 75% concentration of grape seed oil. The different concentrations of grape seed oil were given to the pigeons in water by dropping. The blood samples were collected after one month from each group and transported to a private laboratory. Addition of grape seed oil to pigeons ration (10%, 25%, and 50%) showed no significant effect on the levels of total protein (TP), triglyceride (TG) and cholesterol (Ch) as compared with control group. While there was a significant ($P < 0.05$) decreasing in the level of total protein, triglyceride and cholesterol in the pigeon blood in the fifth group which was given 75% concentration as compared with control group. The results suggest that the addition of high levels of grape seed oil (75%) to pigeons ration will enhance its health status through the decreasing of the total protein, triglyceride, and cholesterol in blood serum pigeons.

KEYWORDS: Grape seed oil, pigeon, triglyceride, cholesterol, total protein.

INTRODUCTION

Grape seed oil is natural oil that was extracted from the seed of *Vitis vinifera*^[1]. It is rich in unsaturated fatty acids such as oleic and linoleic acid as compared with other oily seeds^[2]. The unsaturated fatty acids like oleic and linoleic acid are essential for the human metabolism because the syntheses of these fatty acids are not existed^[3]. The antioxidant properties of grape seed oil have been confirmed^[4,5]. Ozgan *et al.*^[6] reported that the supplementation of around 2% grape seed oil has a significant ($P < 0.05$) effect on low cholesterol-functional egg production. The high concentration of flavonoids such as proanthocyanidins in the grape seed oil has similar effects of vitamin C and works in synergy with vitamin C¹. Anonymous^[7], confirmed that grape seed oil assesses the vitamin C to enter the body's cells and lead to strengthening cell membranes, and protect the cells from the oxidative damage caused by free radicals. Tekeli *et al.*^[8] found that the feed conversion rate of broiler was improved significantly ($P < 0.05$) in the group supplemented with 15g/kg grape seed oil. López-Ferrer *et al.*^[9] reported that grape seed oil has no significant effects on broiler performance. Similar results were found by Gofni *et al.*^[10] and Ozgan *et al.*^[6] in broiler and by Wren *et al.*^[11] in rats. Nakamura and Tonogai^[11] reported that the grape seed oil affected the lipid metabolism of rats and led to decreasing serum and liver triglyceride concentrations. Therefore, the present study was carried out to evaluate grape seed oil in pigeons and its effects on the levels of triglyceride, cholesterol and total protein in blood serum.

MATERIALS & METHODS

Twenty five pigeons *Columba livia domestica* were divided into 5 equal groups. The first group was considered as a control group (this group was given water only). The second group was given 10% concentration of grape seed oil local producing (mix 10 ml of grape seed oil and 90 ml of distal water). The third group was given 25% concentration of grape seed oil (mix 25 ml of grape seed oil and 75 ml of distal water). The fourth group was given 50% concentration of grape seed oil (mix 50 ml of grape seed oil and 50 ml of distal water). While the fifth group was given 75% concentration of grape seed oil (mix 75 ml of grape seed oil and 25 ml of distal water). The different concentrations of grape seed oil were mixed with water by using emulsifying agent and given to the pigeon as drops by using of droplet. In the first day of experiment, pigeons were given 5 drops of grape seed oil in the water and each day increases 1 drop in the waters this process continue for about month. After month, blood samples were collected in test tubes with anti-coagulant (EDTA) from each group of pigeons and laboratory analysis was made to determine the levels of cholesterol, triglyceride and total protein ratio in pigeons blood that were compared with their levels in blood of control group. Determination of cholesterol, triglyceride and total protein was performed as described by Roeschlau *et al.*^[12] and Wahlefeld^[13].

Statistical analysis

The data were analyzed using SAS software^[14]. One way analysis of variance (ANOVA) was performed and means were compared using post hoc t-test to assess the

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significant difference among groups. The difference considered significant when $P < 0.05$.

RESULTS

The results of the present study demonstrated that there was no significant effect of the addition of grape seed oil (10%, 25% and 50%) on the levels of total protein,

triglyceride, and cholesterol as compared with the control (Table, 1), while there was a significant ($P < 0.05$) reduction in the levels of total protein, triglyceride and cholesterol in the pigeon blood for the fifth group which was given 75% concentration of grape seed oil as compared with control (Table,1).

TABLE 1: Means \pm SE of the total protein, triglyceride, and cholesterol in all groups with different concentration of grape seed oil.

Parameters	Treatments				
	1 st group Control	2 nd group 10% conc. of GSO	3 rd group 25% conc. of GSO	4 th group 50% conc. of GSO	5 th group 75% conc. of GSO
Triglyceride mg/100ml	190 $\pm 4.1^a$	188 $\pm 1.8^a$	188 $\pm 2.5^a$	180 $\pm 18.2^a$	160 $\pm 2.1^b$
Total protein mg/100ml	270 $\pm 2.7^a$	259 $\pm 3.8^a$	254 $\pm 6.1^a$	240 $\pm 7.2^a$	170 $\pm 1.4^b$
Cholesterol mg/100ml	220 $\pm 11.9^a$	200 $\pm 13^a$	197 $\pm 9.4^a$	199 $\pm 17.3^a$	168 $\pm 4.8^b$

Means with different letters in the same row differ significantly ($P < 0.05$). GSO= Grape seed oil

Administration of grape seed oil notably repressed the rise of plasma triglyceride and cholesterol and total protein in high concentration of grape seed oil of 75% (Fig. 1, 2 and 3).

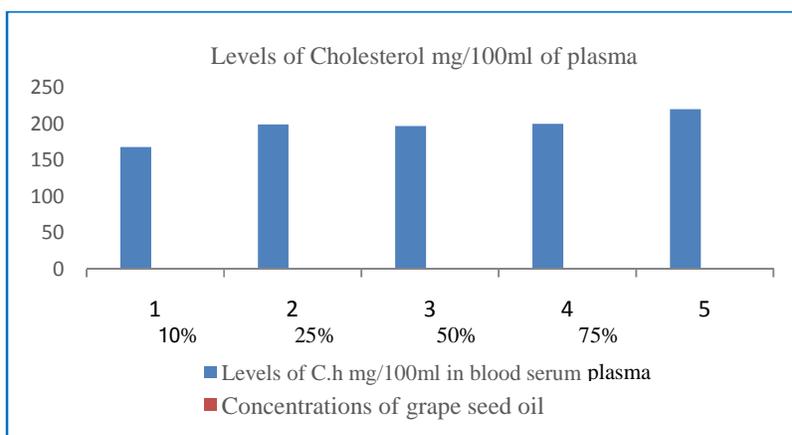


FIGURE 1: Levels of Cholesterol mg/100ml of plasma of all groups which were treated with different concentration of grape seed oil.

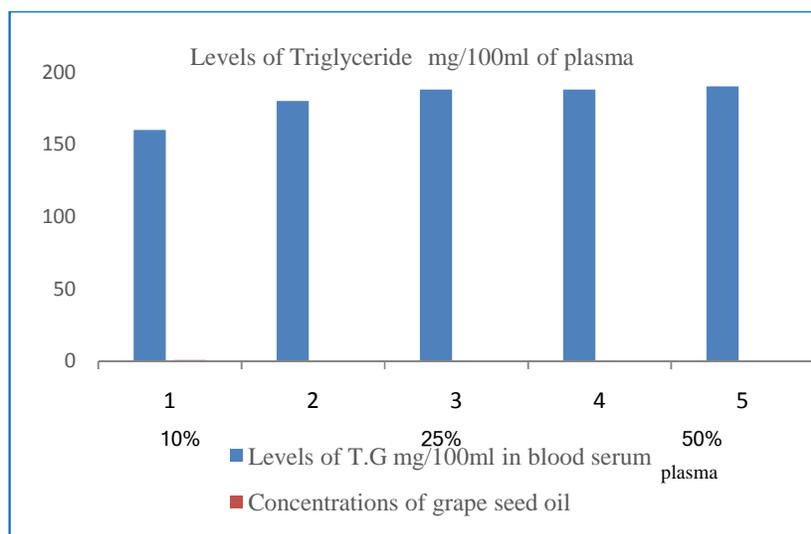


FIGURE 2: Levels of Triglyceride mg/100ml of plasma of all groups which were treated with different concentration of grape seed oil.

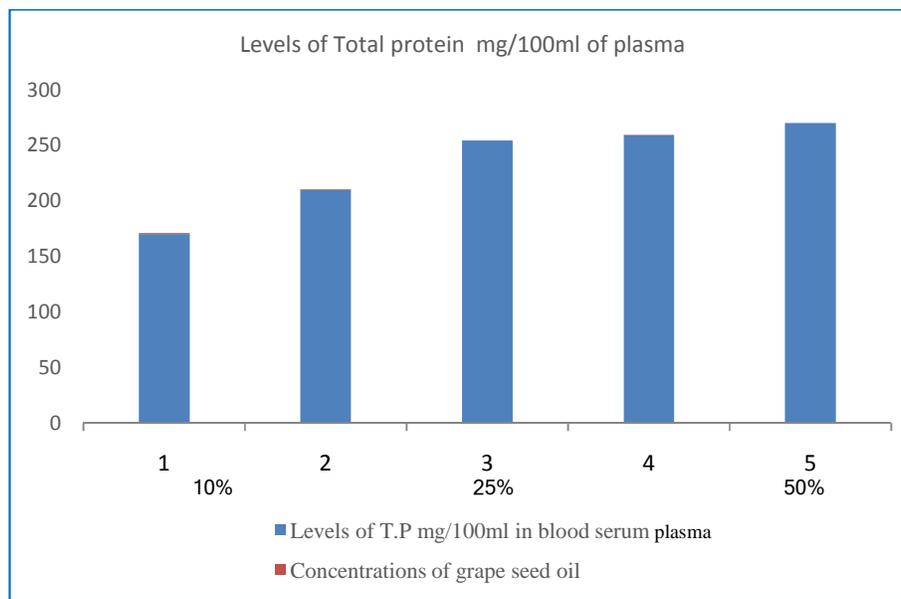


FIGURE 3: Levels of Total protein mg/100ml of plasma of all groups which were treated with different concentration of grape seed oil

DISCUSSION

The results of the present study demonstrated that the addition of the addition of grape seed oil has no significant effect on the levels of total protein, triglyceride, and cholesterol in the second, third and fourth gatherings which were given 10%, 25% and 50% concentration of grape seed oil respectively as compared with the control (Table, 1). These findings agreed with some results obtained by several researches^[15-18]. While there was a significant ($P < 0.05$) reduction in the levels of total protein, triglyceride, and cholesterol in the pigeon blood in the fifth group which was given 75% concenter of grape seed oil as compared with the control (Table 1). This could be attributed to the action of the antioxidant supplements (chromium polynicotinate, grape seed concentrate, and zinc monomethionine) which led to a significant lowering of the systolic blood in normotensive rats, and decreased lipid peroxidation^[19].

Administration of grape seed oil notably repressed the rise of plasma triglyceride and cholesterol and total protein in high concentricity of grape seed oil of 75% (Fig. 1, 2 and 3) and this agreed with some results obtained by some studies (8 and 21-24). The grape seed oil was lessened plasma lipid profiles and keeps a high fat eating regimen elicited stoutness in hamster and related metabolic^[20]. The supplemented with proanthocyanidin-rich concentrate from grape seed represses improvement of atherosderosis in cholesterol in rabbits^[21].

The mechanics of activity is identified with avoidance of low density lipoprotein oxidation in the blood vessel. The study showed that grape seed oil reduce the plasma cholesterol in rabbits administrated an elevated cholesterol diet. This activity was connected with decreases the danger of atherosclerosis and coronary illness^[22] (26). Numerous endeavors to locate the capable mechanics for anti-hyperlipidemic effectiveness of grape seed oil have been concentrated, especially in the restraint of lipase^[23] and cellular cholesterol uptake^[24].

Grape seed oil is light taste and high polyunsaturated fat content. The metabolic energy density of grape seed oil is typically of vegetable oils which has 120 kcal per 15 ml table spoon. It contains lineolic acid that act to increase high density lipoprotein (HDL-C) or good cholesterol level and reduces LDL level. It contains vit. E and low in saturated oil and act as anti-inflammatory that lead to a good health for brain, heart, tissue fibers^[20].

CONCLUSION

This study confirmed that high concentration of the supplementation of grape seed oil lessened plasma total protein and cholesterol and triglyceride.

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