ORIGINAL ARTICLE

Liver and Body Weight in Albino Rats Associated with Olive Oil Diet Supplemented With Atherogenic Element

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ABSTRACT

This was designed to see the possible effects of olive oil on liver and body weight of albino rats. For this purpose, 50 albino rats of eight weeks age were selected and divided into five groups of ten animals each with equal number of males and females. Group I, normal control, was fed on synthetic diet, group II was on low olive oil diet only and group III was on low olive + hypercholesterolemic diet. Group IV was on high olive oil diet only and group V was on hypercholesterolemic diet only for the next 24 weeks. Highly significant difference ($p<0.01$) was noted in the mean body weight of different animals when compared with zero and 24^{th} week body weights. Comparison of body weights in different groups at 24^{th} week showed increase in body wt and difference was statistically highly significant when compared with control group. Similarly we recorded and compared the weights of liver at the end of study period. Comparison of liver weights in different groups at 24^{th} week showed decrease gain in liver wt. and difference was statistically highly significant when compared with control group. Hence it is concluded that olive oil proved to be beneficial diet. It does not cause decreased gain of hepatic and body weight in low and high concentration when compared with hypercholestremic diet.

Keywords: Olive Oil, Liver weight.

INTRODUCTION

Fats are composed of mostly long chain saturated fatty acids for example, palmitic acid, stearic acid and exist in solid or semi solid state at 37`C. They are mostly derived from the animal sources. Oils contain fatty acids that are mostly unsaturated and exist in liquid form. Monounsaturated fats contain palmito oleic acid and oleic acid[1]. Oleic acid is present in oleic oil and olive oil. Polyunsaturated fatty acids (PUFA) for example, linoleic acid, are present in edible oils like corn oil, soya oil, sunflower oil, cotton seed oil and palm oil. Oleic oil, comprising of high contents of monounsaturated fatty acids, significantly reduces serum cholesterol[2]. Polyunsaturated fatty acids are susceptible to oxidation. LDL oxidation appears to be necessary for LDL uptake by macrophages. MUFA prevent LDL oxidation. Anti-oxidant supplements can protect cellular structure against oxidative stress and lipid peroxidation[3]. In an experimental model, increase in hepatic total cholesterol was observed when dietary lipids levels were increased from 12% to 20 % while protein levels were maintained at 30%. High fat diet increases responsiveness of hepatic stellate cells and fat storing cells of the liver, leading to proliferation of Ito cells, hyperplasia of rough endoplasmic reticulum and increased collagen synthesis[4].

METHODOLOGY

Fifty albino rats of 8 weeks age were taken for this study. The animals were randomly divided into five groups of ten rats each. Group I animals were given synthetic diet for next 24 weeks. Rest of the rats (Groups II, III, IV and V) were weighed and fed on experimental diet for a total period of 24 weeks.

Grouping

- Group I, was given synthetic diet
- Group II was given low olive oil diet only.
- Group III was given low olive oil diet with atherogenic element.
- Group IV was given high olive oil diet only.
- Group V was given atherogenic diet only.

RESULTS

The detail of results are given in tables 1 and 2 .

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Table 1: Weights of albino rats at 0 and 24 weeks

Groups / Animals	Weight of Animals		P Values	
	Zero Week	24 Weeks		
Group 1	170.50 ± 7.82	225.15 ± 10.21	HS	(p<0.01)
Group II	172.92 ± 7.92	222.33 ± 9.80	HS	(p<0.01)
Group III	166.42 ± 10.60	240.5 ± 14.31	HS	(p<0.01)
Group IV	170.08 ± 10.88	230.08 ± 11.04	HS	(p<0.01)
Group V	167.00 ± 10.88	267.92 ± 12.84	HS	(p<0.01)

Table 2: Weights of rats liver at 24th week

	I	II	III	IV	V
Mean±SD	12.4± 1.23	12.2 ± 1.31	18.0 ± 2.05	12.9 ± 1.49	19.8 ± 2.33
Ranges	11.9 - 12.8	11.8 - 12.5	16.5 - 19.2	12.3 - 13.4	18.8 - 21.4

I Vs II (NS)	(p>0.05)	II Vs IV (NS)	(p>0.05)
I Vs III (HS)	(p<0.01)	II Vs V (HS)	(p<0.01)
I Vs IV (NS)	(p>0.05)	III Vs IV (HS)	(p<0.01)
I Vs V (HS)	(p<0.01)	III Vs V (S)	(p>0.05)
II Vs III (HS)	(p<0.01)	IV Vs V (S)	(p<0.05)

DISCUSSION

In the present study, low and high concentration of Olive oil with and without hyprcholesterolaemic supplement, were given to the albino rats (group II - IV) for a period of 24 weeks and then body weights were recorded. Statistically highly significant difference (p<0.01) was noted in the mean body weight of different animals when compared with zero and 24th week body weights (Table 1).

Comparison of body weights in different groups at 24th week showed increase in body wt and difference was statistically highly significant when compared with control group (Table 1). Similarly we recorded and compared the weights of liver at the end of study period. Comparison of liver weights in different groups at 24th week showed increase in liver wt. and difference was statistically highly significant when compared with control group (Table 2). The gain in weight is presumed to be due to age and calorigenic effect of different diets. These findings are in agreement with that of Fernandez et al (1997)[5] and Husveth et al (2000)[6] who also observed weight gain in experimental animals with age and varying concentration of fatty diets. Similar results were obtained by Kratz et al (2002)[7] from a long term feeding study of rats that a diet containing transgenically modified olive oil was well tolerated and had similar biological effects.

CONCLUSION

Hence it is concluded that olive oil proved to be beneficial diet. It causes increased hepatic and body weight in low and high concentration.

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