THE EFFECT OF DIFFERENT LEVELS OF OLIVE OIL ON HEPATIC RATS

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The effect of different levels of olive oil on hepatic rats

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Abstract

These research aimed to determine the effect of different levels of olive oil on mice infected with the liver. The study used 24 adult male albino rats, weight 170 ± 10 gm. All mice were fed on a normal diet for four consecutive days. Then the rats were divided into six groups, each with 4 mice. All groups of mice were fed the experimental diet for 4 weeks with the exception of the negative control group, which was fed to the main meal. Mice were injected with experimental groups carbon tetrachloride mixed with paraffin oil to liver injury mice were then taking a blood sample to check the incidence of the disease .The results showed an increase significant in the total weight of the mice infected with the liver and which were fed on the 5%, 10% olive oil significant ($P < 0.05$) compared with the control negative . the results also showed a low of significant differences in total cholesterol and LDL between groups 5%, 10% olive oil and the control group when compared with negative control . finally great significant differences in GPT between the control group and 5% , 10% olive oil when compared to the control group cationic.

KEYWORDS : Hepatic patient - Liver diseases - Olive oil

Introduction

The greatest exponent of monounsaturated fat is olive oil, and it is a prime component of the Mediterranean Diet. Olive oil is a natural juice which preserves the taste, aroma, vitamins and properties of the olive fruit. Olive oil is the only vegetable oil that can be consumed as it is - freshly pressed from the fruit. The beneficial health effects of olive oil are due to both its high content of monounsaturated fatty acids and its high content of antioxidative substances. Studies have shown that olive oil offers protection against heart disease by controlling LDL ("bad") cholesterol levels while raising HDL (the "good" cholesterol) levels. (1-3) No other naturally produced oil has as large an amount of monounsaturated as olive oil -mainly oleic acid.(European Journal of Clinical Nutrition , 2002) .Olive oil is very

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well tolerated by the stomach. In fact, olive oil's protective function has a beneficial effect on ulcers and gastritis. Olive oil activates the secretion of bile and pancreatic hormones much more naturally than prescribed drugs. Consequently, it lowers the incidence of gallstone formation.(World Health Organization, 2006).Studies have shown that people who consumed 25 milliliters (mL) - about 2 tablespoons - of virgin olive oil daily for 1 week showed less oxidation of LDL cholesterol and higher levels of antioxidant compounds, particularly phenols, in the blood.

Aim of study

The effect of olive oil diets on biochemical changes (serum glucose-serum lipids – liver function – kidney function and some physiological change like weight organs) in hepatic rats

Materials And Methods

MATERIALS:

.I) MATERIALS:

1- Olive oil : virgin olive oil were obtained from Minufiya University of Faculty of Home Economic
2- Normal male albino rats were obtained from Research institute of Ophthalmology Medical Analysis Department ,Giza, Egypt.
3- Carbon Tetrachloride Ccl4 and paraffin oil: obtained from Minufiya University of Faculty of Home Economics.
4- Casein :casein as main source of protein obtained from El-Gomhoria Company ,Cairo ,Egypt.

Method

1- preparation olive oil.
2- Drooping of experimental animals (rats).
3- Induction of liver disorder in experimental animals rats..
4- Biological evaluation
5- biochemical analysis.
6- organs weight.
7- Histopathological examination
8- Statistical analysis.

Analytical Methods:

1. Chemical Composition.

- Moisture
- Crude protein was determined using semi micro kjeldahl method according to AOAC (1995).
- Crude fat was determined using Sochelt Apparatus according to AOAC (1995). carbohydrate were calculated by differences :

  Carbohydrates (%) =100-(%Mositure +%Protein +%Fat+ %Ahs + %Fiber).

2. Biological Investigation:

2-1 Experimental Animals:

twenty fore (24) Sprague-Dawley strain male albino rats, weighting 170±10g were used in this study. All rats were fed the control (casein) diet for 4 consecutive days. Each rat was housed individually in stainless steel wire cage under controlled condition. Diets were introduced to the rats in a special non-scattering feeding cup to avoid loss of food and contamination. Tap water was provided to rats by mean of glass tubes projecting through wire cages from inverted bottles supported to one side of the cage.

2-2 Diets:

Semi purified diet was prepared from fine ingredient g/100g. The protein content was added at 12% level on the expens of starch according to (AIN, 1993) presented in the table (A),salt mixture and vitamins mixture were prepared according to (Hegested et al 1941), and (Campbell 1961) as shown in the table (b,c).

2-3 Induced Disease for rats:

Preparation of hepatic rats:

Carbon tetra chloride mixed with paraffin oil used as toxic chemical for liver injury according to the method described by (pass more, east wood, 1986), then fasting blood serum were obtained and levels of Got, Gpt and Alp investigated.

All groups of rats were fed the experimental diet for 4 weeks according to the following groups:

First group: (normal rats):

Group 1: control group (control negative) – five rats were fed basal diet for 28 days.

Second group: (hepatic rats)

Group 1 : rats fed on basal diet only as the control positive
Group 2 : rats fed an basal diet containing 5% olive oil.
Group 3 : rats fed on basal diet containing 10% olive oil.
Group 4 : rats fed on basal diet and oral, 0.25% ml of olive oil.
Group 5 : rats fed on basal diet and oral 0.5% ml olive oil.

Blood sampling:

Blood samples were collected after 12 hour fasting at the end of the experiment. Using the retro - orbital method by means of a micro capillary glass tubes, blood was collected into a dry clean centrifuge tube and left to clot in a water bath (37ºC) at room temperature for half an hour. The blood was centrifuged for 10 minutes at 3000 r.p.m. to separate the serum a part of was subjected to glucose determination and the reminder was carefully aspirated and transferred into clean quit fit plastic tubes and kept frozen at (-20ºC) until analysis. The organs (liver, kidney, heart, and spleen) were removed and washed in saline solution, weighted and kept in formalin solution (10%) according to methods described by Drury and Wallington (1980).

Biological evaluation:

Food intake (consumption), body weight gain% (BWG %), feed efficiency ratio (FER) according to Chapman et al., (1959).

Biochemical analysis:

1) Determination of serum glucose: serum glucose was determined using chemical kits according (Trinder, 1969).
2) Determination of serum lipids:

2.1) Triglycerides:

Enzymatic calorimetric determination of Triglycerides was carried out according to Fassati and Prencipe (1982).

2.2) Total cholesterol:

The principle use of total cholesterol determination according to Allain, (1974).

2.3) HDL-cholesterol:

- ***Principle:***

Phosphotungstic acid and magnesium ions selectivity precipitating all lipoproteins except the HDL fraction-cholesterol present in the supernatant can be determined by the same method used for total cholesterol, according to Lopez, (1977).

2.4) V-LDL and LDL- cholesterol:

The determination of VLDL (very low density lipoprotins) and LDL were carried out according to the method of Lee and Nieman (1996)

2.5)Total Lipids :

Total lipids was determined by colorimetric method (according to schmit 1964)

3. Determination of liver functions:

3.1) Determination of Alanine transferase (ALT):

Determination of (ALT) was carried out according to the method of Tietz (1976).

ALT catalyzes the transfer of the amino group from L-alanine to a-Ketoglutarate resulting in the formation of pyruvate and L-Glutamate ..

3.2) Determination of Asartate Transferase (AST):

Determination of (AST) was carried out according to the method of Henry (1974) and Yound (1975).

3.3) Determination of Total Protein:

Total protein was measured according to the colorimetric method of Henry (1964), by following reaction:-

4. Determination of Some parameters for:

4.1) Determination of Creatinine

Creatinine was determined according to kinetic method of Henry (1974),

4.2) Determination of urea:

Urea was determined according to the enzymatic method of Patton and Crouch (1977),

4.3). Uric acid:

- ***Organs weight :***

After taking retro orbital blood samples, each rat was rapidly opened, the organs (liver, kidney, heart, spleen, lungs, brain) were removed and washed in saline soluation, weighed and kept in formalin solution (10% V/V) according to methods described by Drury and Wallington (1980), then compared to control group .

- ***Histopathological examination :***

Specimens from liver, kidney and heart were collected directly after scarificzed of animals at the end of experimental period, fixed in 10% neutral formalin, dehydrated in ethyl alcohol, cleared in xylene and embedded in paraffin wax 4-6 thick sections were prepared and stained with hemetoxlin and eosin (Carleton,1978)

Statistical Analysis:

Statistical analysis were calculated using one way classification. Analysis of variance (ANOVA),and least significant difference (LSD) according to (Snedcor and Cochran 1967).

Results and Discussion

1) Chemical Results

Chemical composition of olive oil:

The chemical composition of olive oil was analyzed for their contents of moisture, ash, protein, fat, fiber, carbohydrates. The obtained results are presented in the table (1). Data of table (1) showed the chemical composition of olive oil . It is clear that, results of moisture content for olive oil was (0.0%). In addition ash content for olive oil was (0.0). In the same

table it is worthy to notice that protein (0.0%), total fat ,saturated fat , mono un saturated fat , poly un saturated fat(100% ,14% ,73%, 11%) respectively. Furthermore fiber and carbohydrate contents for olive oil were (0.0 & 0.0%), respectively. These results were agree with (Arief Budiyanto et al 2000). shwed that olive oil has more uses than just consuming, it also works as a natural and safe lubricant. For example, lubricating the machinery that is used within the kitchen (grinders, blenders, cookware, etc.)

Table (1) : Chemical composition of olive oil (On Dry) Weight Basis :

Samples Parameter	Constiluents g/100 gm
Moisture (%)	0.0
Ash (%)	0.0
Protein (%)	0.0
Total Fat (%)	100
Saturated Fat	14.0
Monounsaturated Fat	72.0
Polyunsaturated Fat	12.0
fiber (%)	0.0
Carbohydrate (%)	0.0

2) Biological results:

2.1) Effect of olive oil on liver treated groups with Feeding Olive Oil (5% and 10 %).

Effect of olive oil on Body weight gain (BWG%)of change on liver disorder rat- Data in table (2) indicate Body weight gain in both normal and liver disorder rats after 4 weeks of feeding . Body weight gain in normal rats group was (52.4±11.46)gm/100gm. While liver disorder rats groups fed a diet at different levels (positive control , 5%, and 10% olive oil) showed an increase . Body weight gain (35.9±10.58),(63.1± 8.68) , and (70.1±7.37) gm/100gm, respectively. the results showed that all groups were significantly higher ($P<0.05$) when compared with control negative Feed efficiency ratio (fer)values in normal rats group was (0.19±0.03). While in liver disorder rats groups fed a diet at different levels of olive oil were (0.304±0.22 , 0.252±0.03 , and 0.27±0.02,). the result showed that non significant in all group when compared with control negative . Food intake Feed efficiency ratio value in normal rats group was (48.8±31.86)

gm/100gm .While in liver disorder rats group fed diet different levels of olive oil (positive control, 5% , and 10%)showed that (503.6±7.5 , 443.6±7.73 , and 453.4±37.24) gm/100gm ,respectively the results showed non significant between groups (5% and 10%) olive oil (P<0.05) when compared with control negative .

Table(2): Effect of different levels of olive oil on Body weight gain (BWG%), Food intake (FI) (g/28day), and Feed efficiency ratio (FER) in hepatic rats,

Groups / Parameters	Control (-)	Control (+)	5% olive oil	10% olive oil	Sig	LSD
	Mean + SD	Mean + SD	Mean + SD	Mean + SD		
Body weight gain(bwg%)	52.4 b+ 11.4	35.9 c+ 10.5	63.1 ab+ 8.68	70.1 a+ 7.37	*	13.045
Food intake (fi)(g/28day)	478.8ab+31.8	503.6 a+ 7.5	443.6b+ 7.73	453.4 b+ 37.2	NS	0.153
Feed efficiency ratio (fer)	0.19 a+ 0.03	0.304 a+ 0.2	0.252 a+ 0.03	0.27 a+ 0.02	*	33.639

Data in table (3) indicates the effect of level olive oil on organ weight and organ weight /body weight in both normal and liver disorder rats after 4 weeks of feeding .The liver in normal rats group was (2.34±0.15)gm/100gm. While liver disorder rats groups fed a diet at different level of olive oil (positive control , 5%, and 10%olive oil) showed an decrease relative weight of liver (3.008±0.23),(3.12± 0.46) , and (2.78±0.38) gm/100gm, respectively. the results showed that non significant in all groups Relative kidney weight values in normal rats group was (0.646±0.05). While in liver disorder rats groups fed a diet at different levels of olive oil were (0.65±0.05 , 0.56±0.02 , and 0.52±0.07). the result showed that group of 5% and 10% olive oil were significantly increase (P<0.05) when compared with control negative . While non significant between control positive and control negative . Relative heart weight value in normal rats group was (0.318±0.013) gm/100gm .While liver disorder rats group fed diet different levels of olive oil (positive control, 10% , 15% , and 20%)showed that (0.34±0.02 , 00.29±0.01 ,and 0.28±0.03) gm/100gm ,respectively the results showed that non significant between 5% and 10% olive oil . Relative lung weight values in normal rats group was (0.55±0.08). While in liver disorder rats groups fed a diet at different levels of olive oil were (0.5±0.05 , 0.58±0.11 , and 0.57±0.11). the result showed non significant between all groups. Relative spleen t weight value in normal rats group was (0.45±0.1) gm/100gm .While liver disorder rats group fed diet different levels of olive oil (positive control, 10% , 15% , and 20%)showed that (0.46±0.01 ,

0.55±0.04 ,and 0.47±0.12) gm/100gm ,respectively the results showed that non significant between all groups .

Table(3): Effect of different levels of olive oil on Relative Weight in hepatic rats

Groups / Parameters	Control (-)	Control (+)	5% olive oil	10% olive oil	sig	LSD
	Mean + SD	Mean + SD	Mean + SD	Mean +SD		
LUNG	0.55 a+ 0.08	0. 5 a+ 0.05	0.58 a+ 0.11	0.57 a+ 0.11	NS	0.122
LIVER	2.78 a+ 0.38	2.34 a+ 0.15	3.008 a+ 0.23	3.12 a+ 0.46	NS	0.883
HEART	0.318 a+ 0.013	0.34 a+ 0.02	00.29 b+ 0.01	0.28 b+ 0.03	*	0.027
KIDNEY	0.646 a+ 0.05	0.65 a+ 0.05	0.56 ab+ 0.02	0.52 b+ 0.07	*	0.069
SPLEEN	0.45 a+ 0.1	0.46 a+ 0.01	0.55 a+ 0.04	0.47 a+ 0.12	NS	0.127

Table (4) represent the effect of feeding different levels of olive oil on T.Lipids, PH.Lipids, and T-Cholesterol , in both normal and liver disorder rats after 4 weeks of feeding . The total Lipids in normal rats group was (237.6±10.5)mg/dl. While liver disorder rats groups fed supplement diet at different levels (positive control, 5%, and10% olive oil) showed total Lipids values (277.4±3.71 , 243.2± 1.79 , and 233±2.24)mg/dl respectively . PH.Lipids values in normal rate group was (101.6±2.3)mmol/L .While in liver disorder rats groups fed a diet with different levels of olive oil were (107.8±0.45) ,(105.2±0.45), and (105.4±0.9)mg/dl at levels (positive control, 5% , and 10%)mg/dl, respectively.

The effect of different levels of olive oil on total Lipids and Ph.Lipids in table (9) concerning serum total Lipids the results showed that all groups were significantly more ($P<0.05$) when compared with control negative . Also Ph.Lipids showed that rats fed on 10% olive oil was non significant ($P<0.05$) when compared with control negative .Cholesterol values in normal rate group was (81.6±5.13)mmol/L .While in liver disorder rats groups fed a diet with different levels of olive oil were (101.8±3.03) ,(85.4±0.89), and (78.4±2.19)mg/dl at levels (positive control, 5% , and 10%)mg/dl, respectively. Lipids showed that rats fed on 10% olive oil was high significantly ($P<0.05$) when compared with control positive. The present results are going in the same line with (Ichihashi, et al ,2000) suggests that a higher proportion of monounsaturated fats in the diet is linked with a reduction in the risk of coronary heart disease. This is significant because olive oil is considerably rich in monounsaturated fats, most notably oleic acid. in the United States, producers of olive oil may

place the following health claim on product labels: limited and not conclusive scientific evidence suggests that eating about 2 tbsp. (23 g) of olive oil daily may reduce the risk of coronary heart disease due to the monounsaturated fat in olive oil. To achieve this possible benefit, olive oil is to replace a similar amount of saturated fat and not increase the total number of calories you eat in a day.

Table(4): Effect of different levels of olive oil on T.Lipids , PH.Lipids and Cholesterol in hepatic rats

Groups / Parameters	C-	C+	5% olive oil	10% olive oil	sig	LSD
	Mean + SD	Mean + SD	Mean + SD	Mean + SD		
T.LIPIDS	237.6 bc+ 10.5	277.4 a+ 3.71	243.2 b+ 1.79	233 c+ 2.24	*	7.173
PH.LIPIDS	101.6 c+ 2.3	107.8 a+ 0.45	105.2 b+ 0.45	105.4 b+ 0.9	*	1.709
CHOLESTEROL	81.6 bc+ 5.13	101.8 a+ 3.03	85.4 b+ 0.89	78.4 c+ 2.19	*	4.297

Table (5) represent the effect of feeding different levels of olive oil on T.G, HDL, LDL , and VLDL in both normal and liver disorder rats after 4 weeks of feeding . The T.G in normal rats group was (53.2±5.85)mg/dl. While liver disorder rats groups fed supplement diet at different levels (positive control, 5%, and10% olive oil) showed T.G values (68.2±1.3 , 518± 2.68 , and 48.4±0.89)mg/dl respectively . HDL values in normal rate group was (46±1.41)mmol/L .While in liver disorder rats groups fed a diet with different levels of olive oil were (42.4±0.56) ,(45.8±0.56), and (45.2±1.09)mg/dl at levels (positive control, 5% , and 10%)mg/dl, respectively.the result showed that non significant differences between 5% ,10% olive oil and control negative when comperd with control positive .LDL values in normal rate group was (26.56±3.24)mmol/L .While in liver disorder rats groups fed a diet with different levels of olive oil were (54.6±2.69) ,(28.12±2.69), and (24.28±1.63)mg/dl at levels (positive control, 5% , and 10%)mg/dl, respectively.groups of 5% and 10% olive oil high significantly ($P<0.05$) when comperad with control negative . VLDL values in normal rate group was (10.62±1.17)mmol/L .While in liver disorder rats groups fed a diet with different levels of olive oil were (13.44±0.7) ,(10.63±054), and (9.68±0.18)mg/dl at levels (positive control, 5% , and 10%)mg/dl, respectively. The result showed non significant differences between 5%, 10% and control negative when compard with control positive .The present results are going in the same line with (Mangas et al 2001). showed that rats fed olive oil enriched with the non-fatty acid components had greater beneficial effects on HLD “good” cholesterol than did those fed ordinary virgin olive oil, or oil enriched with Oleic acid.

Table(5): Effect of different levels of olive oil on T.G, HDL, LDL and VLDL in hepatic rats.

Groups / Parameters	Control (-) Mean + SD	Control (+) Mean + SD	5% olive oil Mean + SD	10% olive oil Mean + SD	sig	LSD
T.G	53.2 b+ 5.85	68.2 a+ 1.3	51.8 b+ 2.68	48.4 b+ 0.89	*	4.441
HDL	46 a+ 1.41	42.4 b+ 0.56	45.8 a+ 0.45	45.2 a+ 1.09	NS	1.289
LDL	26.56 c+ 3.2	54.6 a+ 2.69	28.12 b+ 1.4	24.48 c+ 1.6	*	3.175
VLDL	10.62 b+ 1.1	13.44 a+ 0.7	10.36 b+ 0.5	9.68 b+ 0.18	*	0.988

Table (6) reflects the effect of different level of olive oil on creatinine , urea and uric acid values in both normal and liver dis order rats fed diet with different level of olive oil . urea values recorded (27.6±4.77)mg/100ml in normal rats group .While liver disorder rats fed olive oil at values (positive control , 5% and 10%) showed serum urea levels (30±2.83 , 37±4.12 , and 27.6±1.34)mg/100ml , respectively. As for urea the results revealed that non significant in all groups . Accorded to the same table normal rats group recorded serum creatinin level (0.598±0.07)mg/100ml. While olive oil supplemented with different levels to the diet were (positive control, 5% ,and 10% ,) presented the values (0.6±0.007 , 0.68±0.02 , and 0.644±0.03)mg/100ml , respectively . the results showed that significantly higher ($P<0.05$) between 5% and 10% olive oil when compared with control negative. Also in the same table normal rats group recorded U.acid level (1.68±0.39)mg/100ml. While olive oil supplemented with different levels to the diet were (positive control, 5% ,and 10% ,) presented the values (1.5±0.07 , 1.1±0.14 , and 1.9±0.17)mg/100ml , respectively the result showed that high significantly in all groups($P<0.05$)

Table(6): Effect of different levels of olive oil on renal Functions in hepatic rats.

Groups / Parameters	Control (-) Mean + SD	Control (+) Mean + SD	5% olive oil Mean + SD	10% olive oil Mean + SD	sig	LSD
UREA	27.6 a+ 4.77	30 a+ 2.83	37 a+ 4.12	27.6 a+ 1.34	NS	4.721
CREATININ	0.598 b+ 0.07	0.6 b+ 0.007	0.68 a+ 0.02	0.644 b+ 0.03	*	0.054
U.ACID	1.68 ab+ 0.39	1.5 b+ 0.07	1.1 c+0.14	1.9 a+ 0.17	*	0.305

Table (7) revealed the effect of olive oil on enzymes activity (.GOT, GPT ,and ALP) on both normal and liver disorder rats groups . GOT level in normal rats group was (94.8±6.61)u/l . while liver disorder rats groups were fed diet containing (positive control, 5% and 10% olive oil) recorded (178.4±11.26),(99.8±1.3)and(90.4±2.19)u/l , respectively. Normal rats group represented GPT level (42.8±3.89) u/l .While liver disorder rats groups were fed a diet supplemented with olive oil containing (positive

control, 5% , and 10%) showed a values (73.4±7.16 , 42.6±3.58 , and 40.2±1.79)u/l . With regard to table 10 for enzymes activity normal rats group respresented ALP level (104.6±7.96) u/l .While liver disorder rats groups were fed a diet supplemented with olive oil containing (positive control, 5% , and 10%)showed a values (116.8±2.17),(105±4.47)and (105±3.08)u/l . The results showed that non significant differences between control negative ,5% , and 10% olive oil when compared with control positive .Our finding is in accordance with (Takeuci Hisanao et al 2001), The effects of dietary oils on stress-induced changes in the liver glycogen metabolism of male Wistar rats at 6 weeks of age were investigated.

Table(7) Effect of different levels of olive oil on Some Liver Functions in hepatic rats

Groups / Parameters	Control (-)	Control (+)	5% olive oil	10% olive oil	Sig	LSD
	Mean + SD	Mean + SD	Mean + SD	Mean + SD		
GOT	94.8 b+ 6.61	178.4 a+ 11.26	99.8 b+ 1.3	90.4 b+ 2.19	*	8.919
GPT	42.8 b+ 3.89	73.4 a+ 7.16	42.6 b+ 3.58	40.2 b+ 1.79	*	6.088
ALP	104.6 b+ 7.96	116.8 a+ 3.02	105 b+ 4.47	105 b+ 3.08	*	8.770

Table (8) revealed the effect of olive oil on enzymes activity (T.PRO, ALB, GLOB, BLIL.T ,and BILID) on both normal and liver disorder rats groups . T.PRO level in normal rats group was (5.69±0.23)u/l . while liver disorder rats groups were fed diet containing (positive control, 5% and 10% olive oil) recorded (5.71±0.09),(5.97±0.16)and(5.65±0.26)u/l , respectively. Normal rats group represented ALB level (3.78±0.07) u/l .While liver disorder rats groups were fed a diet supplemented with olive oil containing (positive control, 5% , and 10%) showed a values (3.79±0.05, 3.69±0.19 , and 3.90±013)u/l . With regard to table 10 for enzymes activity normal rats group respresented GLOB level (1.87±0.023) u/l .While liver disorder rats groups were fed a diet supplemented with olive oil containing (positive control, 5% , and 10%)showed a values (1.99±0.07),(2.28±0.03)and (1.74±0.21)u/l . The results showed that non significant differences between 5% , and 10% olive oil when compared with control positive. Normal rats group represented BLIL.T level (0.402±0.02) u/l .While liver disorder rats groups were fed a diet supplemented with olive oil containing (positive control, 5% , and 10%) showed a values (0.428±0.02, 0.376±0.04, and 0.396±0.01)u/l .With regard to table 10 for enzymes activity normal rats group respresented BILI.D level (0.13±0.02) u/l .While liver disorder rats groups were fed a diet supplemented with olive oil containing (positive control, 5% , and 10%)showed a values (1.48±0.02),(0.126±0.02)and

(0.116±0.008)u/l . The results showed that non significant differences between all groups.

Table(8) Effect of different levels of olive oil on Some Liver Functions in hepatic rats.

Groups / Parameters	Control (-)	Control (+)	5% olive oil	10% olive oil	sig	LSD
	Mean + SD	Mean + SD	Mean + SD	Mean +SD		
T.PRO	5.69 a+ 0.23	5.71 a+ 0.09	5.97 a+ 0.16	5.65 a+ 0.26	NS	0.263
ALB	3.78 a+ 0.07	3.79 a+ 0.05	3.69 a+ 0.19	3.90 a+ 0.13	NS	0.165
GLOB	1.87 b+ 0.02	1.99 a+ 0.07	2.28 b+ 0.03	1.74 b+ 0.21	*	0.219
BLIL.T	0.40ab+ 0.02	0.42 a+ 0.02	0.37 b+ 0.04	0.39 b+ 0.01	*	0.032
BILI.D	0.13 a+ 0.02	1.48 a+ 0.02	0.126 a+ 0.02	0.116 a+ 0.008	NS	0.026

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تأثير المستويات المختلفة لزيت الزيتون على الفئران المصابة بالكبد

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الملخص العربي

يهدف البحث إلى تحديد تأثير المستويات المختلفة من زيت الزيتون على الفئران المصابة بالكبد. استخدمت الدراسة ٢٤ ذكور الفئران البيضاء البالغة ، وزنها يتراح بين١٧٠ ± ١٠جم. غذيت جميع الفئران على نظام غذائي عادي لمدة أربعة أيام متتالية. ثم تم تقسيم الفئران إلى ست مجموعات، كل مجموعة ٤ الفئران. غذيت جميع مجموعات الفئران على غذاء تجريبى لمدة ٤ أسابيع فيما عدا المجموعة الضابطة السالبة التى تم تغذيتها على الوجبة الاساسية . تم حقن فئران المجموعات التجريبية برابع كلوريد الكربون مختلط مع زيت البرافين لإصابة الفئران بالكبد ثم تم اخذ عينة من الدم للتأكد من حدوث المرض. ثم تم تغذية الفئران على مستويات مختلفة من زيت الزيتون . وأظهرت النتائج ارتفاعا معنويا فى الوزن الكلى للفئران المصابة بالكبد و التى تم تغذيتها على ٥٪ ،١٠٪ زيت زيتون وذلك عند معنوية ($P<0.05$) بالمقارنة مع المجموعة الضابطة السالبة كما اظهرت النتائج ايضا عدم وجود فروق معنوية فى الكوليستيرول الكلى و LDL بين مجموعات ٥٪ ، ١٠٪ زيت الزيتون و المجموعة الضابطة السالبة عند المقارنة بالمحموعة الضابطة الموجبة و اخيرا وجدات فروق معنوية كبيرة فى GPT بين المجموعة الضابطة السالبة و ٥٪ ، ١٠٪ زيت الزيتون عند المقارنة بالمجموعة الضابطة الموجبة .

الكلمات المفتاحية : - امراض الكبد - زيت الزيتون - مرضى الكبد

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