

Evaluation of lipid profile parameters and liver enzyme in sera of local mal rabbits treatment with clenbutrol drug

دراسة كيمو حيوية لتأثير بعض المنشطات الرياضية على ذكور الارانب المحلية البالغة



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Abstract

The current study is conducted to determine the side effects of the drugs Clenbuterol on the level of lipid profile(Cholesterol ,Triglycerides ,HDL-C ,LDL-C VLDL-C) was carried out in sera of adult male rabbit, Twenty one of local rabbit, The animals was divided randomly into 3 groups (7 rabbits in each group) . Three groups G1,G2 were treated orally with (٤٠,8) micro gm/cm³ kg of Clenbuterol respectively for a period of 30 days.

The results showed that the Total cholesterol and Tri glyceride and Low density lipoprotein and very low density lipoprotein significantly decreased in all sera groups compared with control group, while the HDL-C level significant increase in all sera groups compared with control group .While the liver enzyme (AST,ALT , Bilirubin) significant increase in all sera groups compared with control group.

Key words Clenbuterol,lipid profile , Liver function

1. Introduction

Drugs are classified as stimulant metabolites and the use of these artificial instruments is considered a mathematical offense. By 1933, the word doping for athletes became a widespread word, while Rieser and others continued to speak against doping until 1967 as the International Olympic Committee banned their use in the Olympics because sports lacked the energy and sportsmanship gained in aerobic exercise due to doping⁽¹⁾. Therefore, the activator can be considered as any substance or medicine that enters the body and in normal quantities for the purpose of increasing the physical efficiency of obtaining higher athletic achievement and in illegal ways and causing health damage when continuing to use it. Doping means the use and use of drugs or substances or methods prohibited by sport, which are concerned by the World Anti-Doping Agency (WADA). Because of its potential effects on improving performance. Therefore, its use is considered a sports offense as well as its health risks to the users⁽²⁾.

Clenobuterol is a chemically active drug (4-amino-alpha-tetrabylamine-methyl-3,5-dichlorobenzyl-4-amino-3,5-dichloro- α - dimethylethyl (amino) methyl benzenemethanol] and Figure (1) illustrates the chemical formula of the petroleum chlorine.

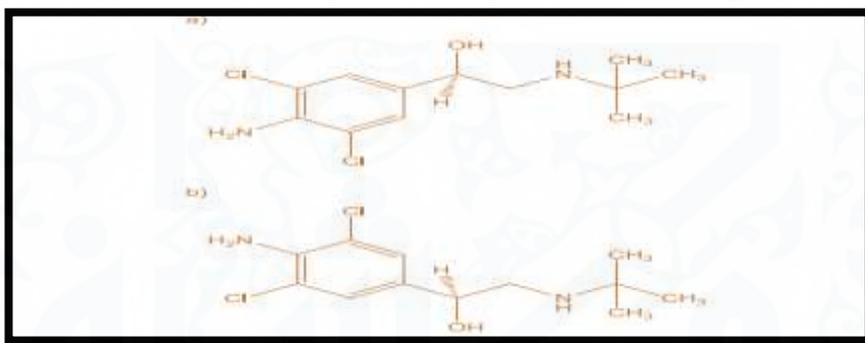


Figure (1) Chemical formula of petroleum kiln

Chlorine Petrol is used in human and veterinary medicine to treat chronic respiratory disorders such as asthma. It is used for the expansion of the bronchi as it increases mucosal transport and removes the suspended particles from the trachea ⁽³⁾, it also works on the relaxation of smooth muscles, making breathing easier, it is known as thermal drugs ^(5,4). It also acts as a smooth muscle relaxant, making breathing easier. It is known as alkma. Beta-2 β 2-adrenergic receptor is found in the membrane of a complex cell. This complex activates the α unit of protein G, which moves to the enzyme adenylatecyclise. This enzyme converts adenosine triphosphate (ATP) into cyclic adenosine monophosphate (cAMP) which in turn binds to the protein units of the protein Kinase and then works on the phosphorylation of proteins. These proteins may be

enzymes and cloning agents Lipase (HSL), Perilipin, Acetyl-CoA), hormone sensitive ⁽⁶⁾. As the drug is toxic, it inhibits the action of the enzyme tryzimin enzyme in the digestive system ⁽⁷⁾. Choline Petrol has some pharmacological similarities with adrenaline and salbutamol, but it has more effects as it is superior to the central nervous system ⁽⁸⁾, and as an inflammatory agent within the central nervous system as it plays a role in the emergence of certain diseases, including anxiety and behaviors associated with depression ⁽⁹⁾. However, over time, it has been found that Choline Petrol has side effects on low fat level and increased muscle protein so it has been used as a tonic for bodybuilders in order to accelerate the process of metabolism by reducing fat in muscle mass and increasing protein accumulation as well as increasing physical performance ⁽¹⁰⁾. As well as the role of LDL in cholesterol levels and LDL cholesterol levels, leading to a significant increase in HDL level, as well as a significant reduction in the concentration of uric acid and urea in the treatment of the drug ⁽¹¹⁾. Because of the relationship between lipid levels and olfactory cholesterol, the current research objective is to determine the effect of chlorine petroleum on lipid levels and liver function in male rabbits.

2. Material and Methods

Preparation of Drug Suspension

Clenbuterol was prepared by grinding and dissolving the tablets of the drug Clenbuterol. The weight of the active ingredient was 5 milligrams per milliliter and each bead was

diluted with 5 cm³ of water and a suspension solution was obtained to ensure complete dissolving. The ultrasonic cracker was used to increase the temperature of the device to 40 mg to get the process of dissolving the real estate tablets and obtain a homogeneous solution so obtained a concentration (5 mg), so that each 1 cm³ concentration of 1 mg, and to obtain the concentration of 5 mg, the whole grain is crushed and melted with distilled water size of 5 cm³.

Animals used in the experiment

The trial included the study of the effect of the oral dosage of Clain Oil as it was injected orally and with concentrations (1-5 mg / cm³) per kg and daily. The experiment was conducted on adult male rabbits, the period of the trial was 30 days.

The laboratory animals of 21 rabbits were divided by their weights to 3 groups and 7 rabbits per group according to the following sequence:

Control group C +: swallowing by 5 ml of distilled water daily.

Group G1: - orally injected with Clintroloprotein 40 mg / cm³ / kg daily.

Group G2: - orally injected with Clenbetrolo at a concentration of 8 µg / cm³ / kg / day.

After the delivery period, the animals were fed for 21 hours, after which 3-4 cm³ of the blood was collected directly in the cardiac catheterization method. The blood serum was

obtained after the blood was separated by a centrifuge to measure the levels of fat and liver function.

-Determination of fat levels

The total cholesterol level was estimated by Allain ⁽¹²⁾ method, the level of 3-fold polysaccharides according to Fossati method ⁽¹³⁾ , the high-density protein (Gotto) level ⁽¹⁴⁾ and the low-density and very low density lipoprotein.

- Determination of liver function level

The level of the enzyme AST was estimated by the method ⁽¹⁶⁾. The level of bilirubin was estimated by method ⁽¹⁷⁾.

-Statistical analysis

The results were statistically analyzed using ANOVA and Minitab and compared to the Duncun's Multiple Range test using the Duncun's Multiple Range Test ($P < 0.05$)⁽¹⁸⁾.

Result and Dissection - Fat levels

- Measure the level of total cholesterol

Table 1 shows that the average \pm standard deviation of cholesterol was 19.500 ± 1.452 mg / cm³ and 28.094 ± 2.195 mg / cm³ in serum G1 and G2 respectively and treated with chlorine petroleum while 44.66 ± 4.61 mg / Cm³ in serum control group.

The results showed differences in cholesterol level, showing a significant decrease ($P 0.05$ 0.05) in the blood vessels of the two groups compared to the control group.

Table (1): - Mean \pm standard deviation of fat levels

Groups	Cholesterol (mg/dl)	T.G (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	VLDL (mg/dl)
C+	44.66 \pm 4.61a	69.684 \pm 1.382b	4.178 \pm 0.567e	26.61 \pm 4.71a	13.934 \pm 0.278a
Clenbuterol					
G1	19.500 \pm 1.452d	38.23 \pm 2.29e	5.244 \pm 0.227ab	6.614 \pm 1.547d	7.644 \pm 0.457d
G2	28.094 \pm 2.195c	62.69 \pm 2.68c	5.034 \pm 0.615bc	10.664 \pm 1.720c	12.536 \pm 0.538c

**** Similar characters indicate that there are no significant differences, but different indicate the existence of moral differences.**

The results of the current study showed a decrease in the level of cholesterol as a result of treatment with Clenbterol. The results agreed with the findings of Hadi (2016) ⁽¹⁰⁾ in its study on the effect of Clenobuterol on fat levels and concentrations (2,4,6) $\mu\text{g} / \text{kg}$, Cholesterol level. The results were consistent with the results of the researcher ⁽¹⁹⁾, which found that the level of cholesterol is reduced by the impact of the drug.

Cholesterol may be the result of its consumption. It is the essential material for the construction of steroids, and

supports the follicle maturation, elongation, and luteinization⁽²⁰⁾. The decrease in concentration may be due to its conversion to testosterone. To pregnenolon with the help of enzyme 17 α -hydroxylase (P450 17OH) then pregnenolon converts to Testosterone with the help of dehydrogenase 3 α -HSD, especially in the high concentration group and the treatment with testosterone propionate⁽²¹⁾.

In addition, the drug may have a role in inhibiting the absorption of cholesterol from the food in the intestines, inhibiting its production in the liver, stimulating its biliary secretion and placing it with fecal waste outside the body⁽²²⁾.

Measure the level of triglycerides in serum

Table 1 shows that the average \pm standard deviation of triglycerides was 38.23 ± 2.29 mg / cm³ and 62.69 ± 2.68 mg / cm³ in serum G1 and G2 respectively and treated with cline petroleum while 69.684 ± 1.382) Mg / cm³ in serum control group.

Results showed a difference in the level of triglycerides, showing a significant decrease (P 0.05 0.05) in the G1 and G2 blood groups compared to the control group.

indicated⁽¹⁰⁾ a decrease in the level of triglycerides due to treatment with Clenbuterol, which is consistent with the current research results.

The effect of adrenergic agonist on adrenergic receptor-2 β pathway receptors is complex and this complex will activate the alpha- α alpha of the G protein and then the adrenergic

receptor / AMP-dependent pathway-2 β ⁽²³⁾It moves to the cyclaseAdenylate enzyme. This enzyme converts adenosine triphosphate into mono-phosphate monoclonal adenosine, which will bind to protein kinase. This protein will then turn into an active protein kinase, which in turn will activate Hormone sensitive lipase-HSL, which dissolves triglycerides Glycerol and fatty acids are made Concentration of fatty acids and Alkliceirol will increase. He also noted ⁽²⁴⁾ that the drug inhibits the process of manufacturing fatty acids and the formation of triglycerides and explained that the increase in the process of fatty metabolism and decrease the process of construction in the lipid cell leads to a decrease in fat cell hypertrophy and lead to a decrease in fat deposition, on the other hand ⁽²⁵⁾ indicated that the mammals that use the drug have a lower fat and also between the low rate of fat in animals treated with the drug accompanied by an increase in the rate of protein and increase in muscle mass.

Measuring the level of high density lipoprotein in the serum

Table 1 shows that the average \pm standard deviation of high-density lipoprotein (5.244 ± 0.277 mg / cm³ and 5.034 ± 0.615 mg / cm³ in group 1 G2G serotonin respectively and treated with Choline Petroleum (4.178 ± 0.567) Mg / cm³ in serum control group.

The results showed significant differences in the level of high-density lipoprotein (HDL), showing a significant increase (P 0.05 0.05) in the serum G1 and G2.

The reason for the high concentration of HDL-C is explained by the reduction in cholesterol that decreased during the time period under the influence of drugs, which led to an increase in HDL-C. This may be due to the increased effectiveness of the enzyme Lecithin cholesterol Acyl Transferase, where the cells of the intestines and liver are stimulated to increase the production of Apo - A, which is necessary in the production of high - density lipoproteins⁽²⁶⁾ HDL-C is more dense lipoproteins and contains a lower amount of triglycerides Its protein content is high as it transfers cholesterol from different parts of the body to the liver for good cholecystolysis. It also transports proteins from the LPL promoter to VLDL ⁽²⁷⁾. At the same time, HDL-C decomposes to zeolite acid, and high density lipoprotein Protect the heart to contain ⁽²⁸⁾. On the other hand ⁽¹⁰⁾ showed a significant increase in the level of high density lipoprotein when using the drug and the concentration of petroleum (2,4,6) $\mu\text{g} / \text{kg}$. The reason for the increase was due to the effect of the drug is that the lipoprotein is composed of a high proportion of protein and a lower proportion of fat and because the drug Choline Petroleum works to reduce the level of fat and increase the production of protein, so the level of HDL ⁽²⁹⁾.

Measure the level of lipoprotein and low serum density

Table 1 shows that the average \pm standard deviation of low lipid protein was $6.614 \pm 1.547 \text{ mg} / \text{cm}^3$ and $10.664 \pm 1.720 \text{ mg} / \text{cm}^3$ in serum G1 and G2 respectively and treated with cline petroleum while $26.61 \pm 4.71) \text{ mg} / \text{cm}^3$ in serum control group

The results showed differences in the level of lipoprotein and low density, showed a significant decrease (P 0.05 0.05) in serum groups compared to control group.

The results of the present study are consistent with the results obtained ⁽¹⁰⁾ due to the effect of clenbterol and different concentrations. The decrease may be due to the increased concentration of HDL-C, which has been shown to stimulate the transport of cholesterol from the blood to the liver. TG is metabolized from the body and leads to low serum LDL-C concentration⁽³⁰⁾. The role of LDL-C It is known to be a major transporter of cholesterol from the liver to the peripheral tissues and it has a high percentage of cholesterol, so its serum concentration is reduced due to low concentration of cholesterol in the blood ⁽³¹⁾.

Measure the level of lipoprotein and very low density

Table 1 shows that mean \pm standard deviation of VLDL was 7.644 ± 0.457 mg / cm³ and 12.536 ± 0.538 mg / cm³ in serum G1 and G2 respectively and treated with clenbetrol while 13.934 ± 0.278 mg / Cm³ in serum control group.

The results showed differences in the level of lipoprotein and very low density, showed a significant decrease (P 0.05 0.05) in serum groups compared to the control group.

⁽¹⁰⁾ showed a significant decrease in VLDL level due to the use of chlorine oil and different concentrations. The reason for the decrease in VLDL level due to drug treatment is that this lipoprotein carries high amounts of triglycerides and that the drug inhibits the formation of fat and the transfer of triglycerides from the liver to the fatty tissues and then these

fats will degrade by the drug and then decrease the level of VLDL (29).

Measure the level of liver enzymes

Measuring the level of AlaspartitransFriis in serum

Table 2 shows that the mean \pm standard deviation for AST was 25.540 ± 1.126 IU / L and 15.620 ± 0.779 IU / L in serum G1 and G2 respectively and treated with Clint Petrol while $7.080 \pm .642$) IU / L in serum control group.

Results showed differences in the level of efficacy of the AST enzyme showed a significant increase in the serum of the two groups compared to the control group.

Table (2): - mean \pm standard deviation of liver function levels

Groups	AST (IU/L)	ALT (IU/L)	Bilirubin (mg/dl)
C+	7.080 ± 0.642 f	4.680 ± 0.572 f	0.5050 ± 0.0133 e
Clenbuterol			
G1	25.540 ± 1.126 a	17.360 ± 0.650 a	0.6614 ± 0.0175 c
G2	15.620 ± 0.779 c	12.680 ± 0.817 d	0.5140 ± 0.0161 e

**** Similar characters indicate that there are no significant differences, but different indicate the existence of moral differences.**

The results of the present study are consistent with the findings of 10 different effects of chlorine oil and different

concentrations (2,4,6) $\mu\text{g} / \text{kg}$ on liver function, as the use of high concentration leads to elevated enzymes. It also explained ⁽³²⁾ to the increase in the concentration of liver enzymes due to treatment with the drug and the increase in the efficiency of these enzymes used as an indicator of damage to the tissue of the liver.

The reason for the high concentration of the enzyme may be due to the body's need for large quantities of amino acids. The enzyme may rise to fill the body deficiency⁽³³⁾. The cause of the increase may be damage to the liver cell membranes, causing the enzymes and substances to filter into the blood⁽³⁴⁾. The cause of high liver enzymes due to abnormal structural and functional changes may occur for hepatic cells. Such changes may lead to increased necrosis of hepatic cells, which free enzymes into the bloodstream⁽³⁵⁾. It may also be due to the building of the calcification in liver cells, Lead to cirrhosis of the liver which occurs Net The accumulation of fat within liver cells, ⁽³⁶⁾.

Measuring the level of AlalantransFriis in serum

Table 2 shows that the average \pm standard deviation of ALT was 17.360 ± 0.650 mm IU / L and $12,880 \pm 0.817$ mm IU / L in serum G2 and G1 respectively, and treated with cline petroleum, 4.680 ± 0.572) ml IU / L in serum control group.

The results showed differences in the level of activity of the enzyme ALT showed a significant increase in serum group compared to the control group.

The results of the present study are consistent with the findings of ⁽¹⁰⁾ studies on the effect of chlorine oil and

different concentrations (2,4,6) $\mu\text{g} / \text{kg}$ on liver function, as the use of high concentration leads to elevated enzymes. It also explained ⁽³²⁾ to the increase in the concentration of liver enzymes due to treatment with the drug and the increase in the efficiency of these enzymes used as an indicator of damage to the tissue of the liver.

The physiological changes that occur in the liver are unstable because the liver is responsible for metabolizing a lot of toxins and drugs, and may lead to an increase or decrease in liver enzymes. The enzymes are released into the blood circulation after cell damage and any defect in the cellular structure of the liver Increases the level of liver enzymes ⁽³²⁾ .

The increase or decrease in enzymes leads to disruption of the plasma membrane ⁽³⁷⁾. The high level of AST, ALT, which are two indicators of liver function may be due to hepatic dysfunction, hepatic necrosis and chronic hepatitis. The relationship of both enzymes is positively related to liver dysfunction. The ALT enzyme is a sign of injury⁽³⁸⁾. The effectiveness of AST histology is a vital sign of the functions and safety of both the heart and the liver. It arranges the structural units of the proteins. It is released from infected liver cells ⁽³⁹⁾ .

Measuring the level of bilirubin in serum Table 2 shows that the mean \pm standard deviation of bilirubin was $0.6614 \pm 0.0175 \text{ mg} / \text{cm}^3$ and $0.5140 \pm 0.0161 \text{ mg} / \text{cm}^3$ in serum G2, G1 respectively and treated with chlorine petroleum while it was $(0.5050 \pm 0.0133) \text{ mg} / \text{cm}^3$ in serum control group.

The results showed differences in the level of bilirubina showed a significant increase in serum G1 group compared to the control group, while the G2 did not show any significant differences.

The reason for the high level of bilirubin may be due to disturbances in the metabolic pathways of bilirubin, which lead to obstruction of metabolism and increase the breakdown of red blood cells, resulting in an increase in production to the level that exceeds the liver's metabolic capacity⁽⁴⁰⁾, and that damage to the liver leads to the high concentration of bilirubin, which leads to the inability of the liver enough to link and extraction of bilirubin and this is called liver cells that the blockage of bile ducts lead to the recovery of bilirubin and from it to the blood and this is called bile ducts ⁽⁴¹⁾.

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