Effect of Androgenic Anabolic Steroide Dianabol In Liver and Kidney of Male Albino Rats

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Abstract:
Dianabol are being abused normally, Sportspersons, coaches, and doctors should be aware of their risky side effects. Athletes used for rise performance, lean muscle bulk, muscular strength and Increases aggressiveness and sureness in addition the Adverse effects of AAS on many organs such as liver and kidney which are study now . In this research The rats were divide in to three groups ,( 4 replicates for each) . The first group control was orally received normal saline for such period . while the second group (t2) and third (t3) treated groups orally received oraly dianabol suspension at concentrations 30 and 50 mg/kg/day for 8 weeks respectively.

Serious alterations of different organ systems have been attributed to long-term use of these drugs show the effect Liver tissue treated with this drug show moderate congestion , moderate sinusoidal dilatation and moderate periportal lymphocytic cell infiltration while (group2) show moderate congestion and mild periportal lymphocytic cells infiltration in addition to mild necrosis .that means increase the dose of this drug show more harmful effect on the liver. and moderate tubular swelling, moderate glomerular atrophy and mild bowman’s capsule thickening in the kidney tissue.

Key Word(Dianabol +Liver   & Kidney)

Introduction :
Anabolic-androgenic steroids (AAS) used for treatment indifferent conditions such as delay puberty, reproductive system dysfunction, breast cancer and anemia [1,2]
Athletes used for increase performance, lean muscle mass, muscular strength and Increases aggressiveness and confidence [3].

The side effects of anabolic steroids on various organ systems including cardiovascular and hepatic pathologies, as well as abnormalities in lipid profiles, which may increase the risk of cardiovascular disease. Alterations of the endocrine function have been shown to be associated with testicular atrophy, and reduced testosterone levels. Furthermore, psychiatric turbulences such as dependence and drawing syndromes have been reported to be frequent and often severe in anabolic steroid abusers [4]. Because unforeseen death as a result of cardiomyopathy, myocardial infarction (MI), and stroke can occur as a result of different effects of the substances used [5,6]the growing incidence of steroid abuse is of considerable interest to the forensic pathologist.

Structurally, androgens decrease elastin and increase collagen and other fibrous proteins in arterial vascular tissue and skin [7–8]. Functionally, androgens have been linked with an enhancement of vascular reactivity and with a decrease in aortic smooth muscle prostaglandin [9].

Materials and methods
1-Laboratory animals :
Twelve native rats Rattus rattus have been brought from animal house of college of sciences /university of Baghdad . These rats were kept through experimentation periods Ad libitum for ration and housing [10] in animal house of college of biotechnology /Al-Qasim Green university . The average weight of such animal ranged between 240-290 gm and their ages...
ranged from 4-5 months. The animals have been subjected to laboratory conditions divided in to 12 hours light and 12 hours dark and the temperature is set at 28±2 c°.

2-Preparation of drug suspension :
The methandrostenolone (dianabol) was obtained from the pharmacy and their equipment from company of british dispensy as a tablets in concentration 5 mg/kg. The tablets were infused by mixer and each tablet dissolved in 10 ml of physiological normal saline, and the concentration of experiments were done according to the doses for human [11].

3-Dosing protocol :
The rats were divide in to three groups , (4 replicates for each) . The first group control was orally received normal saline for such period , while the second group (t2) and third (t3) treated groups orally received dianabol suspension at concentrations 30 and 50 mg/kg/day for 8 weeks respectively.

4-Histological study
The removed spiciments were placed in Formalin fixative for 24 hours and properly labelled. They were removed from the fixative, blotted, and cut longitudinally into two halves and each half was again fixed in new Formalin 10% fluid for another 24 hours [12].

Tissues were dehydrated in rising grades of ethyle alcohol, cleared in xylene-I and xylene-II, and embedded in paraffin. The infiltration with paraffin and embedding was done at 58°C.

Six microns thick sections were cut on rotary microtome, floated on warm water bath at 42°C and mounted on gelatinized glass, appropriately numbered with a diamond pencil. The slides were saved in a slanting position for about half an hour to drain excess water. Sections were dried on a hot plate at 37°C for 24hours.and then we are histopathological analysis.

Results
The results of the present study show some difference in the finding between two groups
The kidney tissue of group 2 show moderate tubular swelling(fig 2) while these swelling increased in the group 3. Moderate glomerular atrophy and mild bowman’s capsule thickening seen in both groups(fig 3).

Liver tissue treated with this drug (group 2) show moderate congestion , moderate sinusoidal dilatation and moderate periportal lymphocytic cell infiltration(fig 5) while (group3) show moderate congestion and mild priportal lymphocytic cells infiltration in addition to mild necrosis .that means increase the dose of this drug show more harmful effect on the liver (fig 6).
Figure (1) cross section of kidney tissue in control group explain kidney tissue with normal picture (Hematoxylin & Eosin ·20X)

Figure (2) cross section of kidney tissue in treatment group 2 explain kidney tissue with moderate tubular swelling and Moderate glomerular atrophy and mild bowman’s capsule thickening (Hematoxylin & Eosin ·20X)
Figure (3) cross section of kidney tissue in treatment group 3 explain kidney tissue with increased tubular swelling and Moderate glomerular atrophy and mild bowman’s capsule thickening (Hematoxylin & Eosin · 20X)

Figure (4) cross section of liver tissue in control group explain liver tissue with normal picture (Hematoxylin & Eosin · 20X)
Discussion

Data from larger observational studies [13] suggest that the majority (88%-96%) of anabolic steroid users experience at least 1 subjective side effect. It can be decided that the potential side effects of anabolic steroid use can be divided into several categories, including cardiovascular, hepatic, endocrine/reproductive, psychological, musculoskeletal, and dermatologic related.
Our study showed Liver central vein thrombosis, with dilatation of sinusoids, furthermore inspection of slid section also showed hemorrhage and sever necrosis, the effect was agreement with [14] that established liver treated with Anabolic show elucidate cellular swelling, vacuolar degeneration in the cytoplasm of hepatocytes. It should be emphasized that pre-existing liver disease or simultaneous use of other medications may increase the hepatotoxicity associated with AAS. [15]

Hepatic toxicity related to AAS often is irreversible, at least partially, as has been reported in some case reports, and in some series [16,17,18] however, progression to critical hepatic insufficiency is also probable. [19] Reported forms of liver damage include peliosishepatis (blood-filled cysts in the liver), hepatic adenoma, hepatocellular carcinoma, hepatocellular injury, and even hepatocellular necrosis.

Our result in the liver lesion is agree with number of studies such as [20,21,22] that say the hepatic injury resulting from AAS abuse is ample. Because the use of these sub-stances is illicit, most of the clinical experience derives from case reports. Cholestatic jaundice and raised levels of alkaline phosphatase, with intrahepatic cho- lestasis on biopsy, as well as raise of liver transa-minases with hepatocellular necrosis are perhaps the more frequently described abnormalities, either iso-lated or in combination.

The our result showed kidney tissue of group 2 is moderate tubular swelling while these swelling increased in the group 3. Moderate glomerular atrophy and mild bowman’s capsule thickening seen in both groups. the cause in this stat may be return to that the AAS are considered to influence the haematological system via two main pathways. First, anabolic steroids stimulate erythropoiesis directly and erythropoietin synthesis in the kidney.[23] Secondly, the effects of androgens have been demonstrated to promote erythropoietic stem cell differentiation and to increase the sensitivity of erythroid progeny tors.[24,25] Since the introduction of recombinant human erythropoietin in the 1980s, the administration of AAS for the these effects has been relegated to the background both by clinicians and athletes. and the swelling may be return to increase the total activities of several lysosomal hydrolases in kidney [26]. In kidney and myocardium, the modification of these biochemical parameters is associated with alterations in mechanical stability of the lysosomal membrane and ultra structural changes of the lysosomal-vacuolar system, including an increase in autophagy and accumulation of enlarged lysosomes filled with myelene-like membranes.

References: