The effects of energy drinks, drugs and hormones that taken by the bodybuilding sportsmen on the some liver and kidneys functions in Kirkuk city

Fidan Fikrat. Ahmed
Medical Laboratory Techniques Department, College of Technology/ Kirkuk, Northern Technical University, Kirkuk, Iraq
fidanfekr@gmail.com

Abstract
The present study included one hundred ten volunteers (bodybuilding sportsmen; Ninety sportsmen took stimulants and twenty without stimulants). Then, volunteers distributed to four groups according to the types of stimulant. The first group was control group without stimulants. The second group sportsmen who used energy drinks (Red bull and Power Horse). The third group sportsmen who used drugs (max miz (100mg), XXL protein (100mg)+ sirios mass (200mg)). The fourth group sportsmen who used hormones(testosterone+ insulin+ growth hormone+ nandrolone+ primobolan and stanazol).

The results showed significant increased (P<0.05) in serum aspartate transaminase (AST), alanine transaminase (ALT), cholesterol, triglyceride, urea, creatinine, potassium and decreased sodium in all groups who consumed energy drinks, drugs and hormones compared with control groups.

The aim of this study was to investigate some biochemical parameters included AST, ALT, cholesterol, triglyceride, urea, creatinine, potassium and sodium concentrations in sera of all bodybuilding sportsmen.

Conclusions: concluded from this study that the stimulants which used by bodybuilding sportsmen have risk effects on the liver and kidneys functions.

Keywords: bodybuilding; liver; kidneys; energy drinks; drugs; hormones.

Introduction
The liver is second largest organs (largest gland) in the body. It has not only considerable, reserves but also the ability to regenerate itself and building new cells [1]. The hepatocytes possess different metabolic functions that deal with very essential processes such as deamination, detoxification, transamination, removal of ammonia in the form of urea, biosynthesis, and release of the plasma proteins, and non-essential amino acids with the exception of immunogamma globulins, gluconeogenesis, storage of glycogen, conversion of carbohydrates, and proteins into lipids, synthesis of cholesterol, lipoproteins and phospholipids, oxidation of fatty acids, storage of iron in the form of ferritin, as well as storage of some vitamins [2,3,4,5]. The most common, functions test to explore hepatic status consists of serum total protein, albumin, alkaline phosphatase (ALP), aspartate aminotransferase (AST), total bilirubin (TB) and alanine aminotransferase (ALT) [6].

The kidney is an important organ has, excretory function and other functions such as enzymatic reaction, immunization, maintenance and counter regulation of complex electrolyte, disturbances [7]. The markers of renal function test assess the normal functioning of kidneys. Renal function tests, like creatinine, and urea are parameters to diagnose functioning of the, kidney [8].

So, the aim of this study was to find the effect of energy drinks, drugs and hormones that take by the sportsmen of bodybuilding on the some liver and kidney functions.

Subjects & methods
The study included one hundred ten volunteers (male) were taken in this study. Ninety sportsmen body building randomly who referred to Al-Rafedain hall, Omer hall and Iskan hall in Kirkuk city-Iraq between May 2015 to October 2016 -range between different age group (18-40 years).

Experimental design
In this study One hundred and, ten volunteers were used, and distributed for four groups, as follow (table 1):

1. **Group A**: control group sportsmen without use any drugs or hormones.
2. **Group B**: sportsmen who used energy drinks (Red bull and Power Horse), this group divided to two subgroups:
   1. Used energy drinks for five years.
   2. Used energy drinks more five years.
3. **Group C**: sportsmen who used drugs (1) vitamins like :A, D3 (100mg) and sintrom (100mg).
   2. Proteins like: max miz (100mg), XXL protein (100mg)+ sirios mass (200mg)+ cell tech mig mass and true mass (150mg).
   3. Acids like: amino acid (200mg) and BCAA (100mg)), this group divided to two subgroups:
   1. Used drugs for five years.
   2. Used drugs more five years.
4. **Group D**: sportsmen who used hormones (testosterone+ insulin+ growth hormone+ nandrolone+ primobolan and stanazol), this group distributed to two subgroups:
   1. Used hormones for five years.
   2. Used hormones more five years.
Sample Collections for serological analysis
After preparation general information from sportsmen bodybuilding according to questionnaire were taken. Eight milliliters (ml) venous blood was obtained from the subjects. All blood samples. Sera were obtained after samples and centrifuged and stored at -20°C until assayed for laboratory investigations [9]. Levels of serum AST, ALT, cholesterol, triglyceride, urea, creatinine, sodium, and potassium were measured using standard kits [10, 11, 12].

Table 1: The percent of volunteers in each group

<table>
<thead>
<tr>
<th>Groups</th>
<th>0-5 years</th>
<th>More than five years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>7.3%(8)</td>
<td>11%(11)</td>
</tr>
<tr>
<td>Energy drinks</td>
<td>18.18%(20)</td>
<td>11.81%(13)</td>
</tr>
<tr>
<td>Drugs</td>
<td>15.45%(17)</td>
<td>13.63%(15)</td>
</tr>
<tr>
<td>Hormones</td>
<td>9.09%(10)</td>
<td>14.45%(16)</td>
</tr>
</tbody>
</table>

Cholesterol & triglyceride
The results of Cho & Tri levels in all bodybuilding sportsmen (drugs and hormones) less than five years groups, showed significant increased (P<0.05) compared with all control group, but Cho & Tri levels in the bodybuilding sportsmen energy group drinks show non-significant changes (P>0.05) compared with all control group as shown in table (3). Also, Cho & Tri levels in all bodybuilding sportsmen more than five year groups showed significant increased (P<0.05) compared with all control and less than five years groups as show in table (3).

Table 3: The levels of cholesterol & triglyceride in serum

<table>
<thead>
<tr>
<th>Groups</th>
<th>0-5 years</th>
<th>More than five years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cho (mg/dl)</td>
<td>Tri (mg/dl)</td>
</tr>
<tr>
<td>Control</td>
<td>160 ± 18.4 c</td>
<td>129 ± 9 c</td>
</tr>
<tr>
<td>Energy drinks</td>
<td>169.4 ± 28 c</td>
<td>131.8 ± 14.3 c</td>
</tr>
<tr>
<td>Drugs</td>
<td>236.6 ± 43.9 b</td>
<td>172 ± 13.6 b</td>
</tr>
<tr>
<td>Hormones</td>
<td>276.5 ± 39.1 a</td>
<td>217.8 ± 22.1 a</td>
</tr>
</tbody>
</table>

Urea & creatinine
The results, of urea & creatinine levels in all bodybuilding sportsmen (energy drinks, drugs and hormones) less than five years groups showed significant increase (P<0.05) compare with all control groups as show in table (4). Also, urea & creatinine levels in all bodybuilding sportsmen more than five year groups showed significant increased (P<0.05) compare with all control and less than five years groups as show in table (4).

Table 4: The levels of urea & creatinine in serum

<table>
<thead>
<tr>
<th>Groups</th>
<th>0-5 years</th>
<th>More than five years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urea (mg/dl)</td>
<td>Creatinine (mg/dl)</td>
</tr>
<tr>
<td>Control</td>
<td>26.4 ± 2.78 d</td>
<td>0.8 ± 0.1 d</td>
</tr>
<tr>
<td>Energy drinks</td>
<td>35.2 ± 7.3 c</td>
<td>1.2 ± 0.19 c</td>
</tr>
<tr>
<td>Drugs</td>
<td>49.7 ± 5.54 b</td>
<td>1.6 ± 0.09 b</td>
</tr>
<tr>
<td>Hormones</td>
<td>59.4 ± 6.9 a</td>
<td>1.9 ± 0.23 a</td>
</tr>
</tbody>
</table>

Sodium & potassium ions
The results, of sodium & potassium concentrations in all bodybuilding sportsmen (drugs and hormones) less than five years groups showed significant changes (P<0.05) compare with all control group, but Sodium & potassium concentrations in the

Statistical analysis
Data were analyzed by using a statistical Minitab, program under SPSS. Results were analyzed statistically using, Analysis of Variance (ANOVA) test, in order to evaluate the significance of variability, between treated and control groups.

Results
AST & ALT
The results of AST & ALT activity in all bodybuilding sportsmen (energy drinks, drugs and hormones) less than five year groups show significant increased (P<0.05) compared with all control group as show in table (2). Also, AST & ALT activity in all bodybuilding sportsmen more than five year groups show significant increased (P<0.05) compared with all control and less than five years groups as show in table (2).
bodybuilding sportsmen energy drinks group showed non-significant changes (P<0.05) compare with control group as showed in table (5). Also, Sodium & potassium concentrations in bodybuilding sportsmen (drugs and hormones) more than five year groups showed significant increased (P<0.05) compare with all control and less than five years groups, but potassium concentrations in the bodybuilding sportsmen energy drinks group more than five years showed non-significant changes (P<0.05) compare with control group and bodybuilding sportsmen energy drinks group less than five years as show in table (5).

### Table 5: The concentrations of sodium & potassium in serum

<table>
<thead>
<tr>
<th>Groups</th>
<th>0-5 years Na (mg/dl)</th>
<th>0-5 years K (mg/dl)</th>
<th>More then five years Na (mg/dl)</th>
<th>More then five years K (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>134.6 ± 5 a</td>
<td>4 ± 0.23 c</td>
<td>136.4 ± 4 a</td>
<td>3.7 ± 0.32 c</td>
</tr>
<tr>
<td>Energy drinks</td>
<td>131.5 ± 4.4 a</td>
<td>3.9 ± 0.36 c</td>
<td>125.7 ± 3.2 b</td>
<td>4.2 ± 0.54 c</td>
</tr>
<tr>
<td>Drugs</td>
<td>123.2 ± 3.5 b</td>
<td>5.6 ± 0.59 b</td>
<td>114.8 ± 2.8 c</td>
<td>6.6 ± 0.64 b</td>
</tr>
<tr>
<td>Hormones</td>
<td>112.8 ± 6.6 c</td>
<td>6.8 ± 0.45 a</td>
<td>98.7 ± 11 d</td>
<td>8.8 ± 0.62 a</td>
</tr>
</tbody>
</table>

### Discussion

Backer & Hanadi (2014) referred that the energy drinks (Red bull, Power House, etc) has severity effects on liver functions. They were administrated rats with energy drinks and then, they found the activities of AST and ALT increased in rats administrated with energy drinks compared with control group. They suggested that the most energy drinks cause a disorder in liver which effect the production of their enzymes [14]. Pertusi et al (2001) referred that the Evaluation of aminotransferase elevations in a bodybuilder sportsmen using anabolic steroids. They found that the players whose used anabolic steroids the ALT and AST activities increased compared with control group. They suggest that anabolic steroid-induced hepatotoxicity and disregard muscle damage when interpreting elevated aminotransferase levels [15], that is in agreement with results of present study. Also, In study carried by Ghaly et al. (2015) referred that the effect of Testonon (Body Building Agent) on liver and kidneys functions. They found the activity of AST, ALT, cholesterol, triglyceride and urea activities increased in all rats injected with Testonon. They suggested that Testonon injection at doses used by bodybuilders act to increase the risk of liver damage and kidney failure [16], that is in agreement with results of present study.

In study of Khayyat et al. (2014) to demonstrate the effect of energy drinks (Red bull, Power House, etc) on the kidney functions in rats. They found the levels of urea and creatinine increased in rats administrated with energy drinks compared with control group. They suggested that energy drinks may cause irreversible structural changes in rat renal tissue, which could play an important role in renal dysfunction [17]. In study of Farkash et al. (2009) referred that the anabolic steroids that used by bodybuilder lead to increased the levels of potassium [18], that is in agreement with results of present study. They suggested anabolic steroids can cause acute and chronic health problems. On other hand, the agents that lead to kidneys dysfunctions could caused imbalance of electrolytes and may lead to decrease the levels of sodium [19]. It was concluded from this study that the stimulants which used by bodybuilding players have severity effects on the liver and kidneys functions.

### Reference

تأثير مشروبات الطاقة والعقاقير والهرمونات التي تؤخذ من قبل لاعبي بناء الأجسام على بعض وظائف الكبد والكلى في مدينة كركوك

فدان قفرة أحمد باقر
قسم التحليلات المرضية، الكلية التقنية الشمالية/ كركوك، العراق

المختصر

أجريت الدراسة الحالية على مائة وعشر متطوع من رياضي بناء الأجسام (بشن منهم يستخدمون المشتقات وعوامل بناء الأجسام). تم تقسيم المتطوعين إلى أربع مجموعات عشوائياً على نوع المنشطات. المجموعة الأولى (مجموعة السيطرة) تتضمن المتطوعين الذين لا يستخدمون أي من المنشطات. المجموعة الثانية تتضمن المتطوعين الذين يستخدمون مشروبات الطاقة. المجموعة الثالثة تتضمن المتطوعين الذين يستخدمون الهورمونات، والأخيرة تتضمن المتطوعين الذين يستخدمون مشروبات الطاقة والهرمونات (هرمون التستوستيرون، الإستروجين، هرمون النمو، هرمون الستيرويدات، هرمون البريمينول). هدفت هذه الدراسة إلى جمع بعض المتغيرات الكيميائية التي تضمنت AST, ALT, الكوليسترول، الشحم الثلاثي، الاليتين، والكوليسترول في جميع مجموعات لاعبي بناء الأجسام.

من النتائج: نلاحظ زيادة في بعض متغيرات الكيميائية في المجموعة الثالثة، والثانية مقارنةً بالمجموعة الأولى، وانخفاض في بعض متغيرات الكيميائية في المجموعة الثانية مقارنةً بالمجموعة الأولى.

يُستنتج من هذه الدراسة أن المنشطات المستخدمة من قبل رياضي بناء الأجسام تؤثر على بعض وظائف الكبد والكلي.

References: