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Assessment CDT and Lipid Profile in Rats Undergo Bile Duct Ligation

Fahad Najd Obaid[1*], Haider Salih Jaffat[2], Mohsin Abdulhussein Hasan[3] and Abdul Latif Al Bayaa[4*]

[1]Departmant of Nursing, Altoosi University College, Najaf, Iraq.
[2]Department of Biology, Faculty of Sciences, University of Kufa, Iraq.
[3]College of Medicine, University of Al-Ameed, Karbala, PO No: 198, Iraq.
[4]The Islamic University, Najaf, Iraq.
haider_salih1968@yahoo.com
fahad.najd@altoosi.edu.iq

Abstract

The study was shown by the research laboratories of the Department of Biology / Faculty of Science/ University of Kufa for a period for six months, 40 male rats were used and were divided into three groups; Group A: male rats administered with drinking water as negative control (N. C.) Group B: male rats undergo Bile duct ligation for one week, At the end of the treatment period, male rats were sacrificed and blood samples were obtained for assessment of (CDT levels and levels of T.C, T.G., LDL and VLDL) .
The result has no significant change ($p > 0.05$) in the level of CDT, and then lipid profile levels show a significant elevate in cholesterol, TG, VLDL, and LDL in rats undergoing BDL compare to control groups.

Keywords: BDL**:**Bile duct ligation, CDT: Carbohydrate deficiency Transferrin

Introduction

The liver is the essential structure of vertebrates and certain other animals [1] .In the body of a human, it is situated in the higher right of the abdomen, underneath the diaphragm. The liver has a wide range of important functions, including detoxification of numerous metabolites, protein creation, and the manufacture of biochemicals required for digestion [2–3]

The liver is considered a gland and plays a main important role in metabolism by several bodily functions, including regulated glycogen storage, breakdown of RBCs, plasma proteins syntheses, and hormone creation. Also, It is accessory gastric gland and products bile secretion, an alkaline compound that serves in digestion by emulsifying lipid. The gallbladder, a small organ situated below the liver, stores the bile secretion formed by the liver [4].

The liver is a highly specialized tissue that frequently consists of hepatocytes that regulate various biochemical reactions, including the creation and breakdown of the smallest molecules and complex molecules, several of which are necessary for typical vital function [5]).

Carbohydrate deficiency transferrin is a biochemical indicator of chronic alcohol use, and raised CDT could help detect and observe patients through heavy alcohol consumption. Compared with liver enzyme profiles, CDT could have greater sensitivity in detecting alcohol abuse [6].

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Material and Method

Experiment animal :

By 40 mature male rats, (*Rattus norvegicus*) weighing 200-250 grams were gained from the animal house of the University of Nahrain. The rats were kept in an animal house in the Faculty Of Science - the University Of Kufa, in typical environmental conditions (heat degree 25-28 C° and 12 hour light - dark cycles) and permitted admission to typical research laboratories diets and water.

Experiment Designed

Rats were kept in animals' houses for acclimation to the laboratory environment for two weeks before they were used for the experiment. each of group was designed 20 rats :
Group(A) rats were administrated by normal saline (negative controlled).
Group (B) rats BDL for one week.

Blood Collections

After the experiments finished, all animals were anesthetized by the mix of xylazine 0.1 ml and ketamine 0.5 ml and scarified [7]. The hearts of animals scratched were finished with a 5 ml disposable syringe, and 2-5 ml of blood was drawn carefully and progressively. Blood was put in tubes with gel, left for 30 minutes at room temperature, and used for gated serum by centrifuge at 3000 rpm for 15 minutes for isolated serum and put in a spinoff tube that was kept at (- 20) in a cooler for reassurance biochemicals investigation.

Measurement of CDT

This laboratory test was determined by the ELISA kit BioassayTechnology Laboratory(Catalog No: E0588)

Assessment of total cholesterol (T C)

This kit for quantifiable determent the total of human's cholesterol, serum was provided by Biolabo SA, France [8].

Assessment of HDL- cholesterols (HDL – C)

Serum HDL - Cholesterol's levels measure by HDL - Cholesterol phosphor tungstic acid (PTA) precipitant kits Biolabo SA, France [9].

Assessment of triglyceride (TG)

Triglycerides Kits was provided via Biolabo SA, France. for determinate of triglycerides in humanoid serum [10].

Assessment of very Little density lipoproteins

Very Little Density Lipoprotein (VLDL) that measure by the next principle: VLDL = TG (mg/dl) / 5 [9].

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Assessment of low density lipoprotein level

Low density lipoprotein levels (VLDL) was measured by the following formula: LDL= TC(mg/dl)- VLDL(mg/dl)- HDL (mg /dl) [9].

Statistical Analysis

Result uttered as (Mean ± Standard Error) then Association measurements were achieved by using megastat .entirely comparison were performed by Unpaired sample t-test, while the figures were constructed using EXEL program. P-value < 0.05 is used by way of a statistical significant level [10].

The result

1- Effect of Bile Duct Ligation on level of CDT and lipid profile in rats.

Result in Table (1) show no significants change (P>0.05) of CDT levels in both males rat with BDL compare with control and significant change (P<0.05) in cholesterol ,LDL ,VLDL and TG levels in both males rat with BDL compare with control.

Table (1):

Parameter	Male rats BDL =20	Control Male rat=20
CDT.U/L	7±0.6	7±0.3
cholesterols.mg/dl	196.3±2.0	93.2±0.9
LDL mg/dl	122.5.4±0.3	38.4±0.8
VLDL. mg/dl	553.2013±305.7947	275.7667±23.83808
TG µg/dl	133±1.6	72±1.2

Values are Mean ± SE. difference letters means significant differenced (P < 0.05).

2-Effect of CCL4 and Bile Duct Ligation on weight of body and liver.

Results in table(2) when compare male rat's weight with Bile Duct Ligation (BDL) and control group shows significant increase when treated with BDL.

Liver weight shows significant increase when treated with CCL4 for four weeks and no significant increase when treated with BDL for one week.

Table (2): Weight of body and liver, male rat's treated with BDL .

Parameter / Groups	Changes in body weight (gm)	Changes in Liver weight (gm)
Control (20)	**203 ± 2**	**5.7 ± 0.4**
BDL 1 (20)	**210 ± 1.8**	**6 ± 0.13**

Values are Mean ± SE. The difference letters means significant difference (P<0.05).

Discussion

The results shows a not change in the level of CDT in this groups treated by BDL compared with the control, the reason that CDT is a specific bio-markers of alcohol associated disease and primary detected of alcohol customers agree with [11].

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Initial detected of extreme alcohol used is very essential payable to its harmful special effects on a human organism as well as a person's psychosocial life. It is not surprising that a numeral of scientists have obstinately been searching for an ideal investigative biomarker that might confirm analysis of alcohol abuse . Such an indicators must included clinical and biochemical parameter which would exactly correlate with the presences of ethanol or its metabolite in the organisms, be directed associated with the quantity of alcohol consume, be susceptible enough by correlated the quantity of consumed alcoholl and the psychological hazard [11–12].

The results from this study show a significantly raise in cholesterol, and LDL-C and VLDL levels in groups treated with BDLthis increased due to oxidative stress that caused by toxicity of bile acid [13].

In previous studies after bile duct ligation, bile acid responsible for production of ROS and the toxicity of bile acid responsible in part for hepatic necrosis which is accompany with obstructive cholestasis [13].

Bile acid is caused liver damage throughout cholestasis and apoptosis process which assumed in chief mechanism for liver injures and apoptotic hepatocyte in cholestatic livers[14].

Increase of bile acid and inflammation cells in liver tissues caused free radical creation in biliary obstructions. Which lead to oxidative stresses in etiopathogenesis of the fibrosis of liver tissue. Also, oxidative stress aggravates liver fibrosis through HSC activations, and lipid peroxidation stimulate transcriptions of collagen genes [15].

Results in table (2) when compared weight male rat's treated with BDL with Control group shows significant increase in rats weight ,this result agree with [16].

Body weights increased further as ascites developed, in the present study, the cholestatic rats progressively developed decompensate cirrhosis Which was characterized by the formation of ascites, as reported previously by [16].

The increase of liver weight and volume may be explained by the increase in collagen contented, that distinguishing of cirrhosis, and don't importance of an increase in parenchymia tissues, as the collagen exhibited relative volumetric increases when compare with observe in parenchyma [17].

duct obstruction was related with portal hypertension indicate via splenomegaly, as reported previously by [7] also with decompensates cirrhotic indicate via the developed of the ascites.

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