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Impact Of Ethanol On Male Mice Testes With Ameliorating Effect Of Vitamin E

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Abstract

This study is designed to identify the histological effects of alcohol on testes tissue of the experimental animals (male mice) and investigate the possibility of treating it with vitamin E.

The experiments included 15 male mice divided into three groups, 5 male mice for each one . the first group was control group which given nutrients and water under normal conditions, Second group administrated by 15mg/kg/day for sixty days. Third group was treated with 200 mg of vitamin E with the same amount of ethanol at sixty days.

Our study findings that the animals treated with ethanol appeared some histological damages and missing sperms in many seminiferous tubules, while the group which treated ethanol with vitamin E showed reduction in testicular histological changes.

Key Words : Histological effects, Ethanol, Vitamin E.,Testes, Seminiferous tubes.

Introduction

Alcohol related with the diseases are rising in the world Alcohol consumption contributes for more than 5% of the global mortality (1). Ethanol is a rich source of energy with 7.1 kcal / gm, which is more than the energy that found in proteins and carbohydrates . Ethanol is considered half of the calories by alcohol users, therefore; it displaces natural nutrients and causes folic , thiamine

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deficiency and other vitamins deficiency (2). Alcohol-related diseases are on the rise in developed countries (3). The laboratory studies shown that, the ethanol causes a decreased of the functions in the testicular cells, and this disruptive effect may comes from that has multiple mechanisms, enhance sensitivity to nitric oxide (4) and increase oxidative stress (5).

Vitamin E contains a group of lipid - soluble compounds, that act as antioxidants that defend the organism against oxidative stress (6). Vit.E is believed to be essential components on the sperms antioxidant system (7), and locates itself to biological membranes where it inhibits oxidative stress and oxidative damage to polyunsaturated lipid membranes (8) .

Material and methods

Animals and experimental design

The male mice average weight (135- 200) gm were used. Fifteen animals divided into three experimental groups, five animals in each groups. First group the control, while second group was treated with ethanol 15mg/kg/day for sixty days**.** Third group was treated with 200 mg of vitamin E with the same amount of ethanol given to the second group. At the end of the experimental period, which was sixty days. The animals were sacrificed.

Histological study

The testes were taken after 8 weeks and washed with normal saline and fixed with formalin 10% for a period of 24–48 hours and then washed with running water for half an hour and put with ethanol alcohol from 50–70–80–90–100–100% for an hour in each concentration to withdraw the dehydrated water and then buried The molten paraffin-embedded at a temperature of 60–62°C for a period of two hours was poured into the wax molds, then cutted with a microtome of slee Germany 5 to 4 micrometers thick and then stained with

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eosin-hematoxylin dye. The slides were examined using light microscope and photographed by manipulated camera prepared for this purpose (9) .

Results

The results of histological sections in current study appeared normal histological structure in control group (Fig.1) which shown normal structure for seminiferous tubules , basal membrane, primary spermatocytes and complete sperms in lumen of seminiferous tubules .

In the second group which treated with ethanol 15mg/kg/day for sixty days, showed the seminiferous were histological damage , bleeding and missing of complete sperm in many seminiferous tubules on the other hand, The primary spermatogeic was occurred with significant decrease sperms in seminiferous tubules (Fig. 2), and showed thickness of the basement membrane of the seminiferous tubules (Fig. 3) compared to control group .

Third group was treated with 200 mg of vit.E with ethanol were continued damage to spermatogenic cells with hemorrhage, but they appeared less frequently compared to the secound group (Fig. 4) .

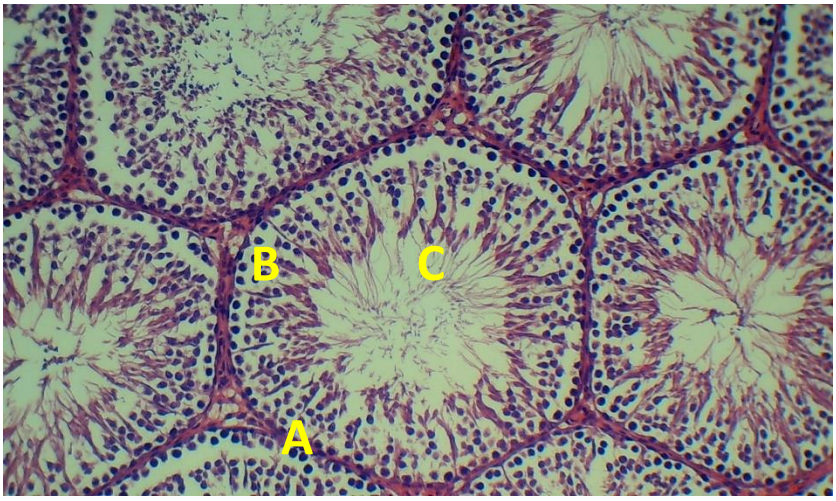

Fig.1: Normal structure of seminiferous tubule in control mice, basement membrane(A), primary spermatocytes(B), sperms(C) **(H&E 40X).**

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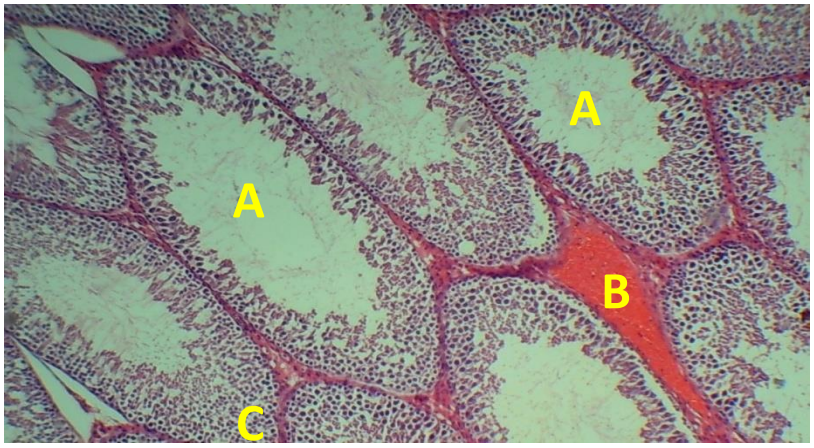

Fig.2: second group treated with ethanol . the seminiferous tubules missing complete sperms (A), Bleeding (B), primary spermatogenic cells (C)**.(H&E 40X).**

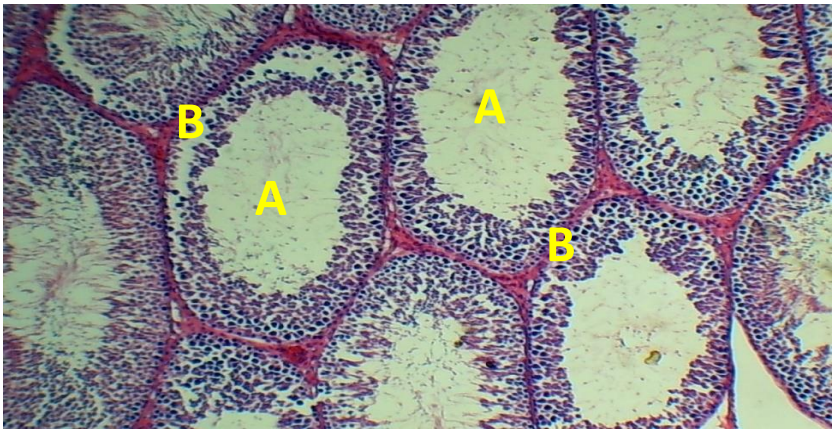

Fig.3: second group treated with ethanol . the seminiferous tubules missing Complete sperms (A), thickness of of the basement membrane (B). **(H&E 40X)**

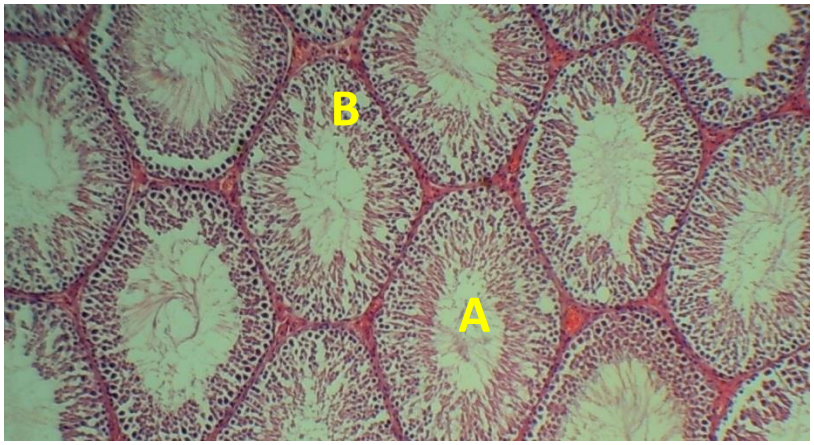

Fig.4: third group treated with ethanol and Vit.E . damage of seminiferous tubules appear less than second group , sperms (A), seminiferous tubules (B**).(H&E 40X).**

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Discussion

In current study, the possible of the preventive effects of Vitamin E on the alterations of alcohol intake on the different abnormal histological changes on testes structure, because the readily available and widely using anti-oxidant . Vitamin E, can prevent the deleterious reproductive changes that are known to be caused by ethanol in testes structural tissue . Alcohol penetrates in all tissues of the body and affects its vital activity Because it is a small molecule capable of soluble in water and fats (10,11). Our findings showed that complete sperms decreased significantly or may missing in group which treated with ethanol when compared to the control group. While treatment with vit. E was prevent some of damages and effects, the studies have reported the harmful effects of alcohol on testes tissue (12,13). Our current results was consistent with (14).

Vitamin E, is found in almonds, spinach, avocados and sweet potatoes that cancel out free radicals and protects the cell membranes from damage by reactive oxygen species ROS. It prevents lipid peroxidation and enhances the function of other antioxidants. Lipophilic character of the vit. E enables it to locate itself inner parts of the cell membrane bilayer, where it rapidly interacts with fatty acid peroxyl radicals, upstream products of lipid oxidation, and intercepts the chain reactions (15,16).

More so, Vitamin E is a major antioxidant that chain-breaks in the sperm membranes. For there, that it acts as a scavenger for the free radicals, superoxide, hydrogen peroxide, and the hydroxyl radicals that by helping to renewal the glutathione (17). Adding vitamin E in diet increased the activity of some enzymes which act as antioxidant factors , decreased nitric oxide content and lipid peroxidation products in the testes of the Boer goat (18,19) .

Conclusion: According to the results of our study and results of similar studies, conclude that the ethanol and an other alcohol causes histological damages in

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testes structure. on the other hand, the vitamin E has protective effects against degenerative changes in seminiferous tubes.

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