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The Effects of Yasmin on the Histology and Histochemistry of Liver and Kidney in Rabbits

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Abstract : *Objective:* The combination birth control pill of ethinyl estradiol with drospirenone (YASMIN) is an effective contraceptive which used by a very large number of women worldwide, and this study was designed to investigate the probable histological and histochemical changes of the liver and kidney accompanied with the treatment by yasmin. ***Methods***: 12 females adult rabbits were used in this experiment (6 treated animals and 6 as control group). The treatment by the yasmin contraceptive pills based on the same way as used for women, regarding the body mass index for dosage, then frozen and ordinary tissue sectioning were performed. ***Results:*** Histological and histochemical (for alkaline phosphatase – ALP- activity) study of both liver and kidney was normal. ***Conclusion:*** Yasmin is safe with regard to the histology of the liver and kidney, and the activity of ALP in these tissues.
Keywords: Yasmin, Histology and Histochemistry, Liver and Kidney, Rabbits.

Introduction

Combined oral contraceptives (COCs) represent one of the most commonly prescribed contraceptive methods and are used by more than 100 million women worldwide[1].These pills contain an oestrogen component (ethinyloestradiol, mestranol, oestradiol or its pro-drug oestradiolvalerate) and a progestogen (levonorgestrel, norethisterone, gestodene, desogestrel, drospirenone, nomegestrol, dienogest or cyproterone)[2]. Yasmin is a combined oral contraceptive tablet containing the synthetic progestogen, drospirenone and the synthetic oestrogen, ethinyloestradiol[3].A large number of publications refer to the rapid evolution of this contraceptive method, particularly with respect to the reduction in the dose of estrogen and the synthesis of new progestogens. More recently, new contraceptive regimens, specifically those involving continuous or extended use aimed at minimizing the hormone-free interval between one package of pills and another, have been considered both by physicians and their patients[4- 6].

The combined oral contraceptive pill is an effective contraceptive method which can also offer other benefits. Women rapidly adopted the pill as it allowed the reliable separation of sex and reproduction and gave them the opportunity to plan when to have children. Since then the pill has been further developed to ensure good efficacy while minimizing the adverse effects[2]. Also, many studies were showed many observations about the COCs, Long-term cohort studies show that, compared to non-users of the combined oral contraceptive pill, users have lower rates of death from any cause. They also have significantly lower rates of death from cancer, cardiovascular disease and other diseases[7]. Another study have evaluated the effects of the continuous use of contraceptive pills on metabolic parameters and coagulation[8].

Animals and methods:

Twelve females adult rabbits were used in this experiment (6 treated animals and 6 as control group). The treatment by the yasmin contraceptive pills based on the same way as used for women (timing and sequence), regarding the body mass index for dosage.

Histological examination:

Ordinary histological sections of paraffin-embedded liver and kidney (5µ thick), stained with hematoxylin-eosin were performed according to Bancroft and Steven,1982[9].

Detection of Alp activity:

Frozen sections was prepared for the study of Alp activity in the liver and kidney. Tissues froze immediately after sacrificing the animals, then sectioning was done by freezing microtome. Finally, sections treated with the chemical solutions and stained with methyl green for the detection of enzyme activity.

Gomori-Calcium method, 1952 (modified) was depended to detect the activity of Alp, as it considered one of the most important depended methods in histochemical preparations[9].

Results and discussion :

Histological study :

Result showed normal histology of liver and kidney of the treated animals in compare with control group, as shown in the figures (1,2, 3, and 4).These results may reflect the safety of yasmin pills, as previous studies referred to the wide use and safety of this drug[2,3]. in spite of the presence of biochemical changes that related to the liver and kidney[10,11,12]

Alkaline phosphatase (Alp) Activity :

In spite of the risks and undesired physiological and biochemical changes that revealed by many previous studies [10, 13-17], but our histochemical study of Alp activity showed a normal activity in both liver and kidney of both study groups in compare with the normal group as shown in the figures (5, 6, 7, and 8). Again this may related to the safe part of the yasmin, or it may be related to the quantity of the biochemical changes. For example studies referred to reduction in total cholesterol, low-density lipoprotein, and increase in high-density lipoprotein[10,12].

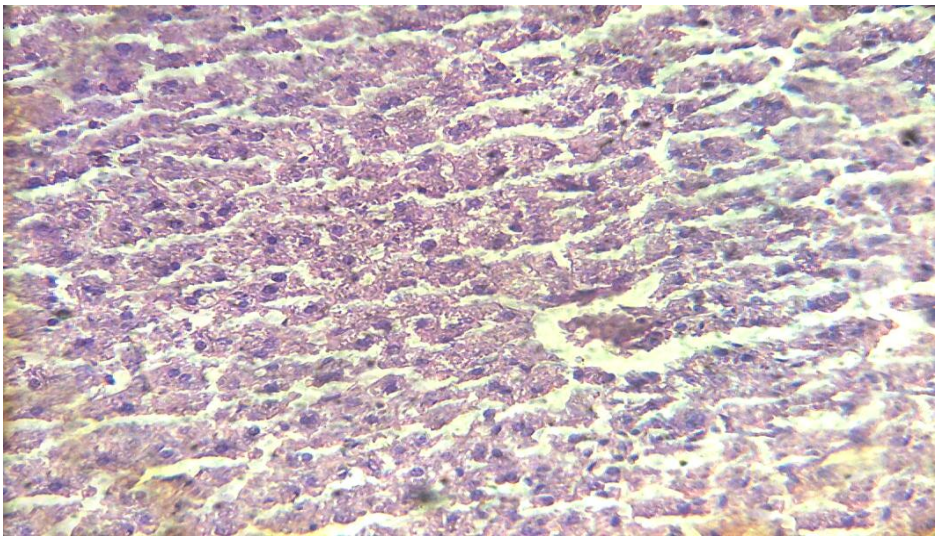

Figure 1 : Histological section in liver of treated animals showing normal histology.

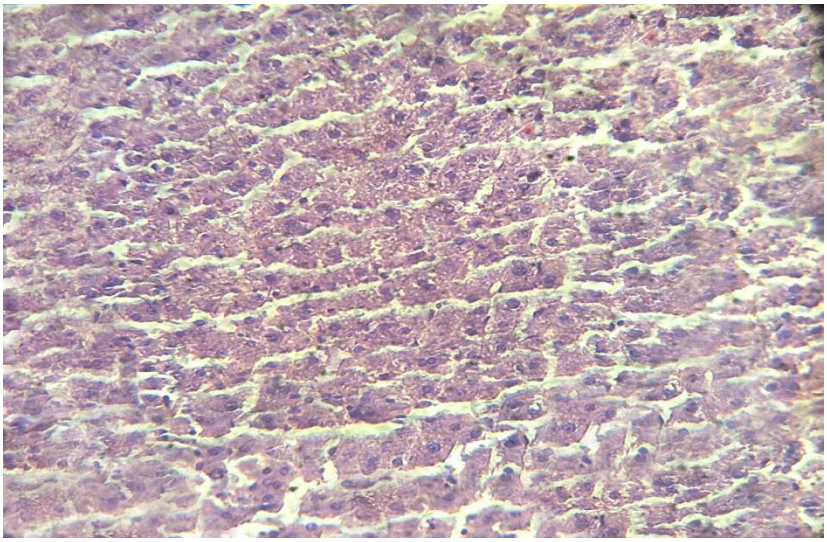

Figure 2 : Histological section in liver of normal animals (control).

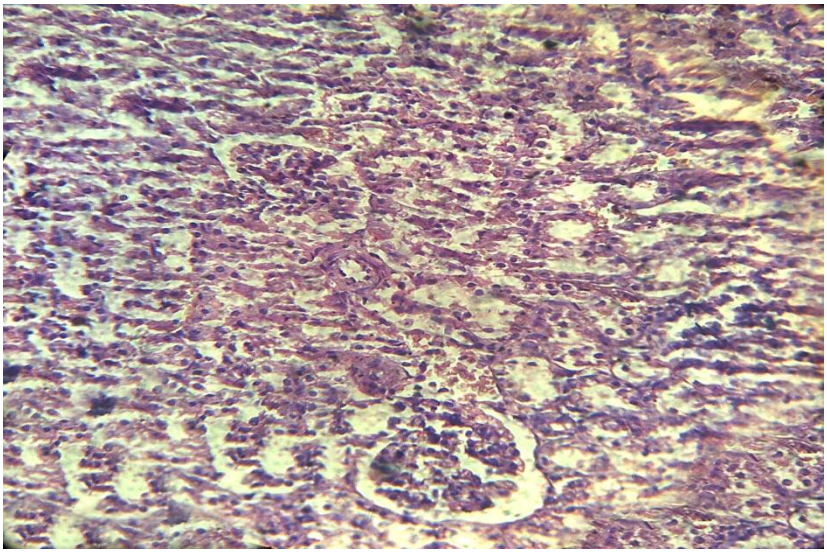

Figure 3: Histological section in kidney of treated animals showing normal histology.

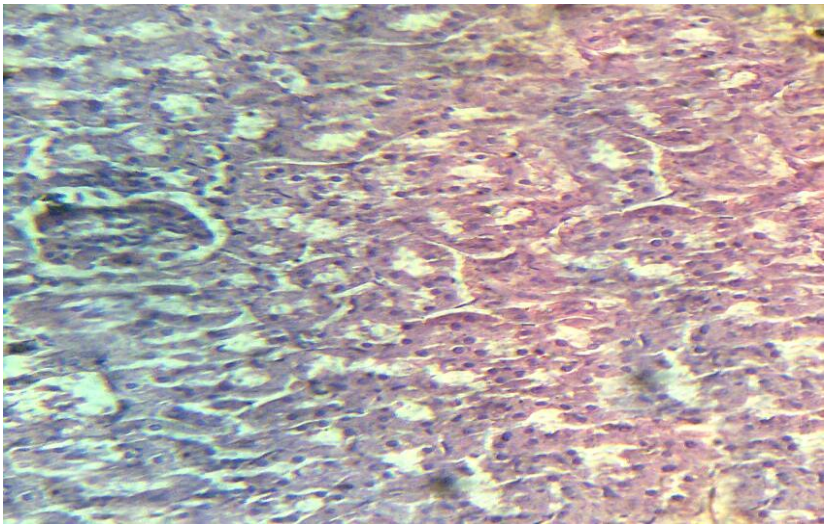

Figure 4 : Histological section in kidney of normal animals (control).

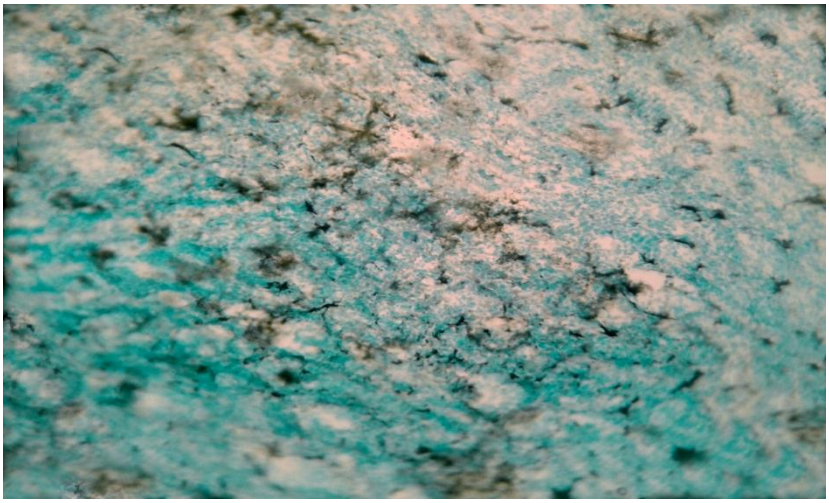

Figure 5 :Frozen histological section in liver of treated animal stained with methyl green, showing normal Alp activity (brown color), hepatocytes stained green.

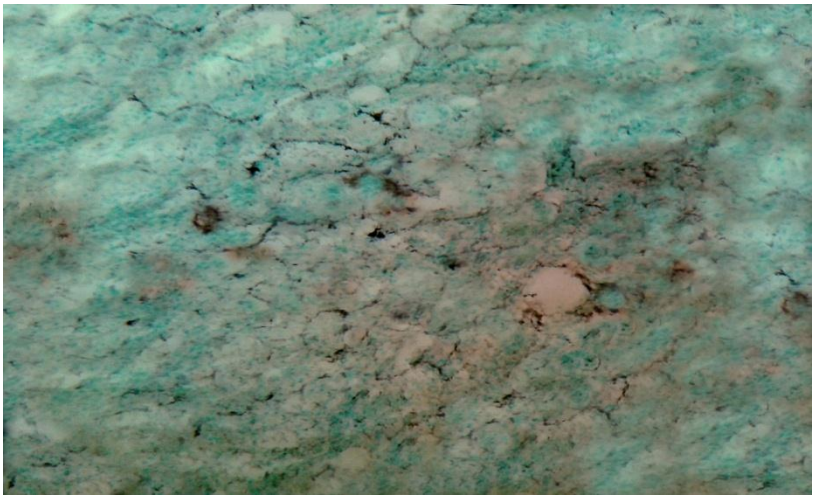

Figure 6 :Frozen histological section in liver of normal animal (control), stained with methyl green, showing normal Alp activity (brown color), hepatocytes stained green.

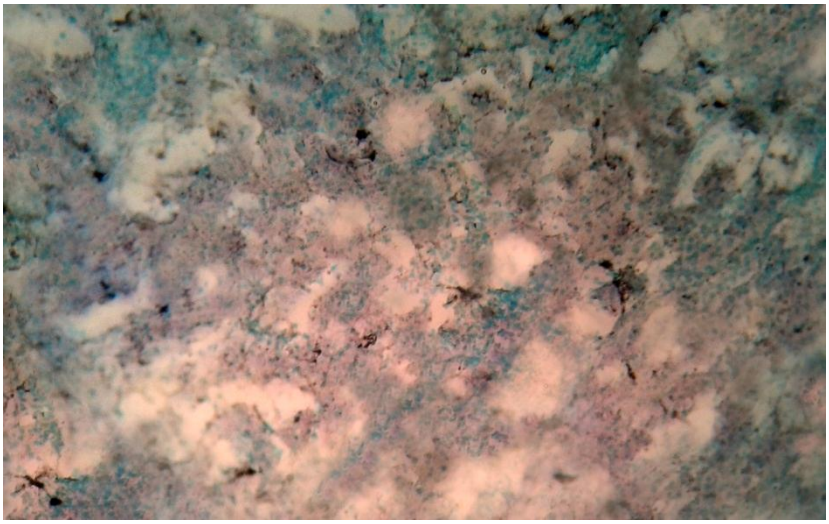

Figure 7 :Frozen histological section in kidney of treated animal stained with methyl green, showing normal Alp activity (brown color).

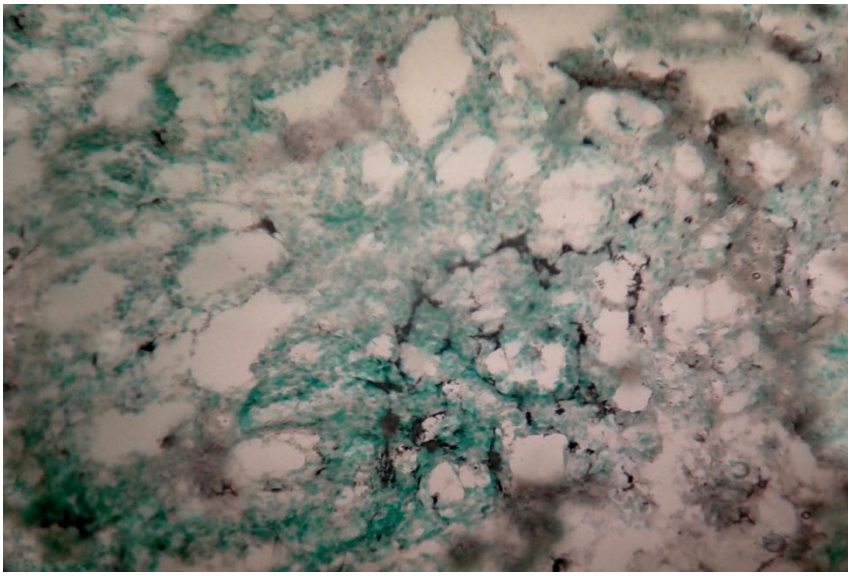

Figure 8 :Frozen histological section in kidney of normal animal stained with methyl green, showing normal Alp activity (brown color).

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