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THE HISTOPATHOLOGICAL CHANGES OF DIGOXIN ON MICE VITAL ORGANS

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ABSTRACT : The aim of this study was investigating to detriment the toxic effects of digoxin on the vital organs of mice like heart, Brain, liver, and kidneys. The experimental animals were categorized into 3 groups (T1, T2& C) each consist of 10 mice divided according to daily treatment with digoxin. T1, T2 groups representing dosing orally with 5, 10 mcg/kg respectively. C group acts as a control and treated with distilled water for 21 days. After a study period, animals were sacrificed. Histological samples were prepared by using hematoxylin and eosin stain. The study results of the T1 group show that different effects in liver tissue: degeneration signs, necrosis, low to severe periportal fibrosis and appear septal fibrosis. In Brain samples, perineural oedema with mild ganglion cell degeneration was clear. Kidney slices show enlargement of Bowman space with shrinkage of glomerular tuft and vacuolation of epithelia of lining urinary tubules. The T2 study group: brain slices present perineural and vascular edema, severe ganglion cell degeneration and necrosis. The renal tissue appears few infiltrations of inflammatory cells and vacuolation of urinary tubules. The main histological changes of Heart slices in both groups (T1, T2) were hemorrhage with oedema but the severity of lesion in T2 was higher characterized by hemorrhage with oedema and hyalinization of the myocardium. In conclusion, this study revealed that the digoxin of both doses: 5 mcg/kg and10 mcg/kg has histopathological effects in different vital organs of mice like (liver, brain, kidney and heart tissue), but these effects were severe in T2 group.

Key words : Histological effect, mice, vital organs, Digoxin.

INTRODUCTION

Histopathological changes regard one of the best methods to study the effects of the drug in experimental animals(Brundha and Nallaswamy, 2019). Digoxin is used in the treatment of several cardiovascular diseases (Virgadamo *et al,* 2015) extracted from digitalis lanata leaves with more effective compound(s) such as glycosides (cardiae glycol-steles) (Roberts *et al,*2015). Molecular weight 780.95. Digoxin is known from the 13th century as the name of digitalis puerperal and in 1776, its active ingredient is known as digoxin (Aronson, 1986). In ancient medical treatments, it was used as diuretic but not as atonic to treat muscle, while it has been recently recorded as atonic for heart muscle by incusing cardiac muscle contraction and increasing cardiac output as well. Digoxin absorption (60-70) on oral usage could produce adverse effect more rapidly (Schoner and Scheiner, 2007). Digoxin is considered as a congestive heart failure, in which heart is unable to pump the blood into the body, leading to deficiency of oxygen of nutrient supplied to the tissue. The risk of heart failure(s) has been raised by hypertension, diabetes, and sexual hormones disturbance that affect the cardiac cells, accordingly, around 60% of patient with congestive heart disease die after 5 years even with treatment (Andersson and Leppert, 2001). Drug usage for a long period has caused a problem like accumulating in the body which is led to appear its toxic effect as appetite, vomiting, and nausea. Additionally, 25% of patients treated by digoxin has been suffered from other symptoms like vertigo and headache, because this is pharma-kinetic occurred by hepatocytes with low therapeutic range (Ehle *et al,* 2011). Therefore, the aim of this study is to evaluate the toxic impact of medical dose and double dose usage on different vital organs of mice.

MATERIALS AND METHODS

Totally, 30 albinomice(adult) have been used in this study with a mean weight of 25 ±30 mg. All arerandomly divided into three groups,including 10 mice as first groupor control group C. Second group or T1 has 10 mice and received Digoxin of 5micro g/kg as oral treatment. Third group or T2 has 10 mice, which isorally treatedby Digoxin