

The impact of the glycerol on the kidney of white male rats (a histological study)

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ABSTRACT

The glycerol is used on a wide scale as drugstores in the manufacture of cosmetics, liquid soap, inks, lubricants, and dynamite. As well as, is used as an additive to foods and beverage and as a thickening agent in alcoholic beverages in alcoholic drinks which help in maintain the cuisine. Also, glycerol is used in medical, pharmaceutical preparations and personal care for moistening, in addition, is used in toothpaste, skin care products, hair and shaving cream. Glycerol is found in the body in the fat composition which is secreted from the body at a rate of 7, 14% without a change in the urine during the two hours and half from ingestion, representing 80% of food, which occurs in the liver and 10-20% which occurs in kidney. Renal failure leads to reduced kidney function and Glomerular filtration rate. A sharp loss on renal function and renal failure occurs in cases muscle fiber is freed and dissociation from hemoglobin, occurs breakups heme from turning into blood Myoglobin. In the current study 50 white male rats were used type of Swiss albino rats. It has been a male rats of two months age, starting weight of between 150-170 grams. It was divided into three groups of ten rats which were treated daily with a dose of glycerol (10mg/kg of body weight) in muscles for 8 weeks has been given by injecting muscle cramps in rear right leg. Histological examination has been done for the rats kidney treated by glycerol. During microscopic examination some pathological situations. Severe deformation of the crust layer kidney atrophy appears in Bowman's capsule and capillary tuft in the presence of spacing in between the fabric tubes near and far. Also, the disappearance of the border nearby alfrshaaeh in vitro hepatocyte enlargement and nuclei and analyse cells for remote pipes and cold blood and bleeding between the tubules near and far. As the decay in cells of nearby pipes and severe deformities in Bowman's portfolio, which reduces the efficiency of the work of the kidneys and cause kidney failure

KEYWORDS: Kidneys, glomerulus, glycerol, acute renal failure, chronic renal failure

INTRODUCTION

Kidney inflammation is one of the health problems prevalent in the world, begins with inflammation and evolves into later stages up to chronic renal failure, which leads to harmful consequences on the organs of the body such as cardiovascular, leading to early death, [1-3]. The kidney is a member of the urinary system essential in the process of nomination of the urine from the blood and maintain the overall size of the physical and fluid regulate the concentration of solutes such as ions of sodium, potassium and calcium. Also, hydrogen ion concentration regulation in blood and put waste and toxins such as urea and creatine, medicines and working kidneys as an endocrinologist so secrete certain hormones: the hormone Renin, which controls the production of angiotensin, where the alarithrobin hormone controls the production of red blood cells that has nothing to do with the internal equilibrium of calcium ion where active absorption in the blood [4]. Feest, *et al.*, [5] dominstratd that the renal failure leads to reduced kidney function and Glomerular filtration rate. As well as, the incidence of urinary obstructive cardiomyopathy associated causes of acute renal failure in newborns by using aminoglikosid antibiotics and analgesics. The creatinine is considered as the most criterion for defining the level of kidney function for measurement of nitrogen in blood by excess uric in blood blood urea nitrogen (BUN) [6].

There are glycerol in the body into fat composition. Glycerol is secreted from the body at a rate of 14.7% unchanged in urine within two and a half hours of ingestion by 80% of the metabolism that occurs in the liver and 10-20% in total. As well as, the frequent use of some materials used in desserts such as glycerol, which is used commonly in industries and has a detrimental effect on the kidneys leading to kidney inflammation has many uses for glycerol in lotions the doctor and medications such as cough syrup and expectorants, toothpaste and cosmetics such as skin and hair care and provide softness and hydration is widely used as a laxative [7]. Fatty substances are converted into fatty acids until transferred to the blood. While, glycerine can be converted to glucose by the liver and provides energy for cellular metabolism, and convert glycerine to glisiraldhid. Feest, *et al.*, [5] confirmed that the renal failure leads to reduced kidney function and Glomerular filtration rate and a sharp loss of renal function. As well as, an increase in the creatinine concentration by 50% in blood serum [8].

In all cases of kidney failure is the emancipation of muscle fiber and dissociation from hemoglobin, occurs breakups heme from turning into blood Myoglobin [9]. It could be seen that tubular necrosis is a characteristic phenomenon common to kidney failure and increased failure lead to the need for dialysis to remove pathogen factors that caused that

a. acute renal failure:

Is fast and sudden decline in renal function, usually within a few days and is common in intensive care units and may affect 1-25% of patients, depending on the population and the criteria that are used to determine the presence of disease [4].

b. chronic renal failure:

Is the late stage of kidney disease and result in a gradual decrease in kidney function in both kidneys and has duration of several months to years and ends up injuring kidney atrophy or damage and may be causes damage to kidney as a result of diabetes, high blood pressure, and kidney disease Polycystic Kidney glomeruli and infections and swelling of parts of the glomeruli that remove waste products and fluids from the blood and damage to the kidneys from heart disease or drug use. kidney fibrosis occurs as a result of the low rate of filtration Glomerular and some cases of kidney failure caused by a disorder of the immune system of the body, so the body material of the tissues, increasing levels of white blood cells attacking the kidney tissue and renal causes of these infections some known and unknown including SLE, viral hepatitis and some types of tumors and some types of medications. High blood pressure are common causes of kidney disease because it affects small arteries located in the kidney which leads to arrogance. There are other reasons less prevalent, such as recurrent urinary tract infection or [4].

MATERIALS AND METHODS

1. Experimental animals:

Used in the current study male rats white tests type of Swiss albino rats. It was in separate cages in appropriate conditions of temperature, humidity, and water and food.

2-Chemicals used:

a. Glycerol:

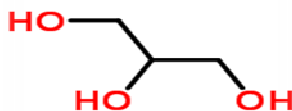
The present study has been used glycerol material based on the previous studies, which indicated the influence of harmful impact on renal lead increased to kidney infections and acute renal failure

Chemical Name: glycerol; glycerin 1- :1,2,3-propanetriol

The structural formula: glycerol; glycerin:1,2,3-propanetriol

Chemical formula: $C_3H_8O_3$

Obtained by the German company sigma-aldrich focus equals 97% in packages containing all of the



Design experiments:

The experience used of 50 male rats, which had been divided into three groups of ten rats were as follows:

Control group (G1): Given standard meal of food and water daily only when the same timing (am).

Second Group (G2): Was treated daily dose of glycerol in muscle for 4 weeks of 10 mg/kg body weight

Third group (G3): Was treated daily dose of glycerol in muscle for 8 weeks of 10 mg/kg body weight.

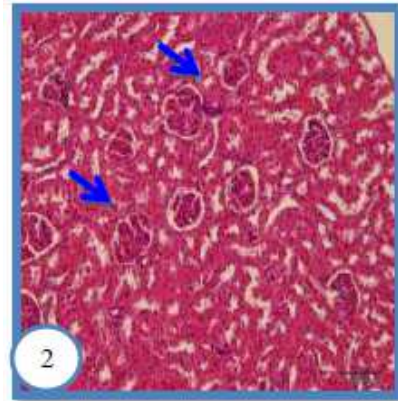
*Results:**Control group:*

Fig. 1: Cross section in the area of the crust where renal tubules near and distant pipe shares (H & E) X400

Fig. 2: Cross section shows installation of the glomerulus and Bowman's capsule with clearly visible strands of capillaries for filtering urine from the blood (H & E) X4

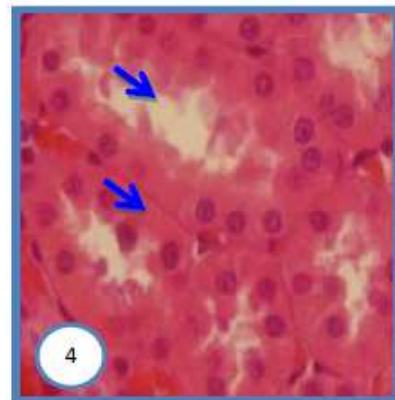
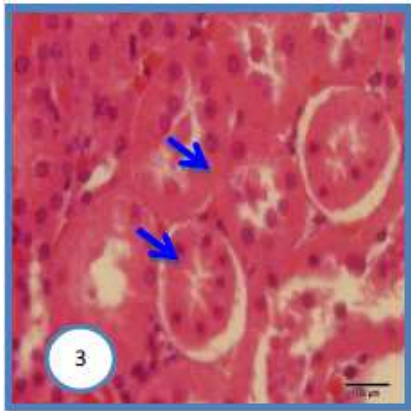


Fig. 3: Cross section in the cortex and renal tubules shows the appearance of the border alfrshaaeh inside (H & E) X400

Fig. 4: Sector in the area of the cortex shows remote pipe fitting and widening the internal cavity size (H & E) X400

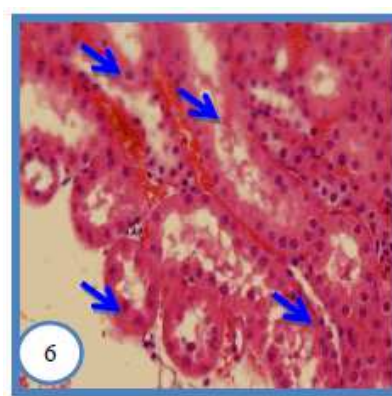
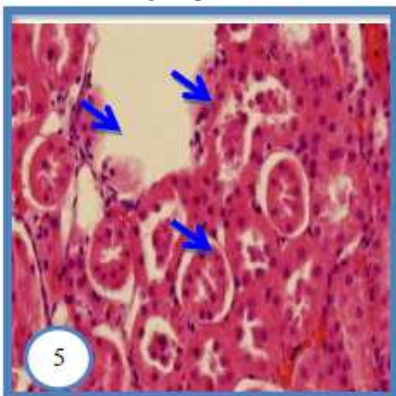
Glycrol treatment group (4 weeks):

Fig. 5: Cross section in the area of crust shows deformation and degradation of renal tubules, hepatocyte enlargement, and distant nuclei and hemorrhage occurs between the walls of the cells and the disappearance of the border alfrshaaeh to nearby pipes (H & E) X400

Fig. 6: Cross section in the cortex shows clear nearby pipe deformation and degradation and the lack of a full border and alfrshaaeh hemorrhage between pipes and the existence of clear spacing in (H & E) X400.

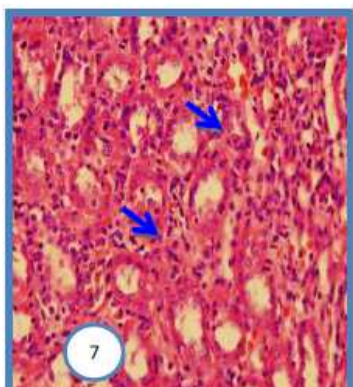


Fig. 7: Cross section in the area of crust shows deformation and degradation of renal tubules and the severity of the deformity leading to cirrhosis in cells (arrow) (H & E) X400 8)

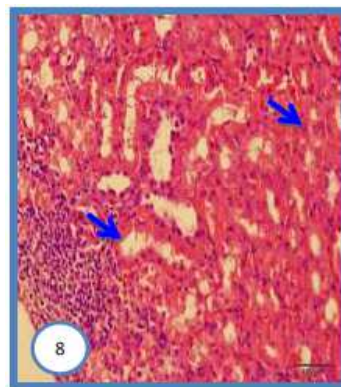


Fig. 8: Peel and necrosis in the pipe walls and clear change in shape of the tube and the integration of cells and causing hemorrhage between the walls of the cells (arrow) (H E &) X400

Glycol treatment group (8 weeks):

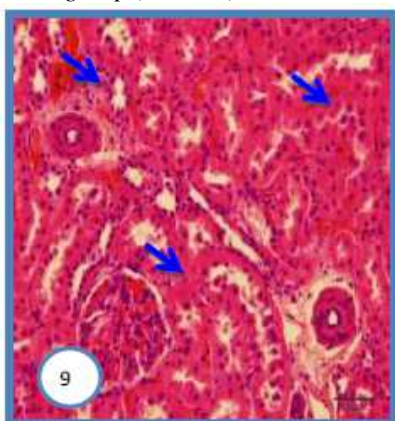


Fig. 9: Severe abnormalities and changes in the glomerulus, the Bowman and analyzes property the capillaries and the existence of ecological distances within the cavity Bowman wallet and bleeding obvious and accumulation of blood within the tubes and cell necrosis and atrophy of the nuclei (arrow) (H&E)X400

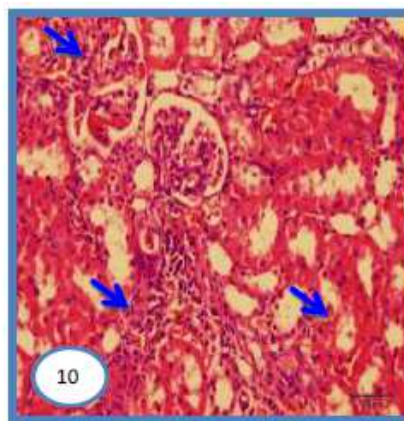


Fig. 10: Clear walls renal tubules decomposition hepatocyte enlargement and integration become nuclei in the cells and defects led to change in form and function of the pipe near and far and clear change and vascular cirrhosis and acute hemorrhage within portfolio Bowman (arrow) (H & E) X400

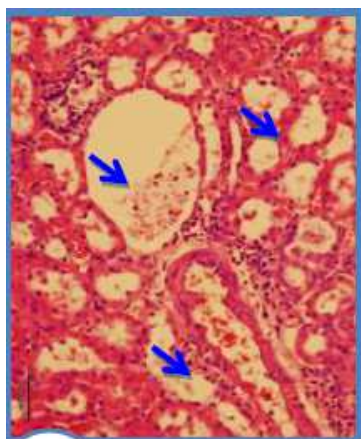


Fig. 11: Acute deformation zone of the cortex atrophy in vitro nuclei near and far and accumulation of blood within the pipe and the emergence of gaps and spacing as a result of decomposition of tubes and cell death reduces the efficiency of the work of the kidneys (arrow) (H & E) X400 12)

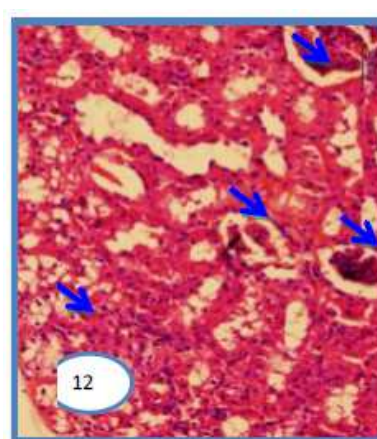


Fig. 12: A clear distortions and decomposition in glomeruli and wallet of Bowman and the widening voids intra portfolio and capillary tuft decomposition (arrow) (H E &) X400

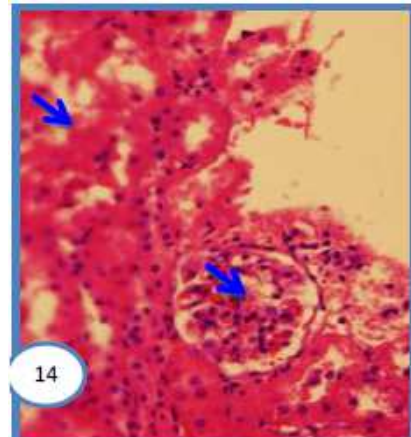
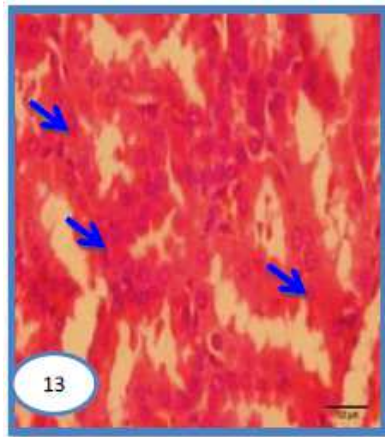


Fig. 13: Clear degradation in walls renal tubules hepatocyte enlargement and integration become nuclei in the cells and defects led to change in form and function of the pipe near and far and the disappearance of the border alfrshaeh (H&E)X400

Fig. 14: Clear degradation in walls renal tubules hepatocyte enlargement and integration of nuclei remote stimulation in cells and defects led to change in form and function the remote pipe. (Arrow) (H & E) X400

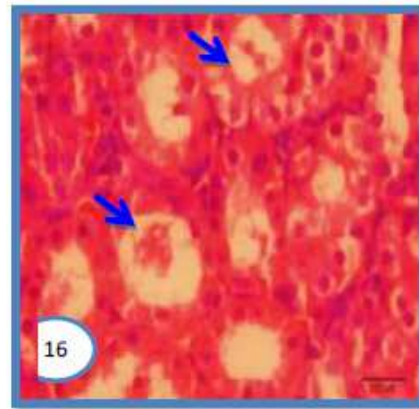
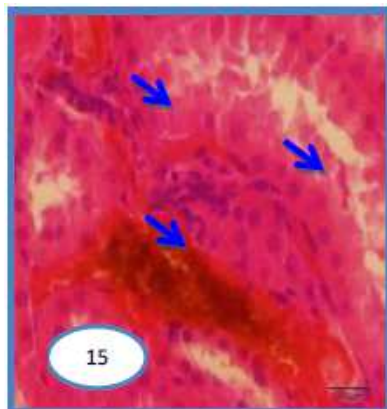


Fig. 15: Sector shows a deformation and illustrates the decomposition of the proximal renal tubules hepatocyte enlargement and nuclei and faded and disappearing borders alfrshaeh in twisted pipe nearby and scaling and integrating cells (arrow) (H & E) X400

Fig. 16: Decomposition is evident in the pipe walls and nuclei hepatocyte enlargement and renal clear cell cirrhosis and acute inflammation and accumulation of blood between pipe walls (arrow) (H E &) 1000 X

Discussion:

Renal failure affects the kidneys and is a public health problem throughout the world [1]. Statistics confirm that the disease of kidney failure is in a continuous increase has several reasons, in this study, we made the disease by a glycerol which was dense, sticky, transparent. This is what the [7] describe the substance glycerol as open and transparent sticky liquid used in pharmaceutical, food and cosmetic. This substance was selected with a concentration of 50% dose 10ml/kg body weight injected in the rear muscle building on previous studies [10-11]. The new was added to this experiment is a daily injection of a glycerol without deprivation of food or water that represented a natural person who is exposed to daily doses of glycerol from either medications or foods. It was noted in rats after 3 weeks with muscle weakness is apparent and this was confirmed by scientists [12], acute renal failure depends on edit almiogloin of bad bites.

Also, it was noted one month after treatment by glycerol injury of strong pipe near and far this observation of [9] in rats after 48 hours of eating the Glycerin. Also, do not deform in the glomerulus and in mice that were treated for 1 month, and 3 weeks by glycerol follows the serum color was red, and that's what was mentioned by Donalde *et al.*, [13] by heme together in urine. Ronge xing *et al.*, [8] identify kidney failure (ARF) that rise in serum creatinine concentration in Serum creatinine by 50% of the basic rate, and noted [9] mice 48 hours after eating infected so powerful in Glycerin pipe nearby and an increase in the level of creatinine in the serum of

mice. But the study noted that there were no statistical differences between the groups treated with additive of glycerol and group processing Arabic Gum as the probability value greater than 0.05. In the group that was treated by glycerol for 1 month and 3 weeks were suffered by acute renal function insufficiency treated with Arabic Gum and noted restoration of kidney tissue has the ability to reconfigure the near wall pipe and far and few between pipe haemorrhage and rebuild the wall of the Glomeruliwallet and a clear tissue change in the collector tube.

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