Abstract

The current study focused on the histological and biochemical changes in some organs of males and females white mice after treated with formalin and citric acid as food preservatives in dairy products. The present study noted the important changes after treated with formalin (0.2%) and citric acid (3%) for 30 days of oral administration. The experimental animals were divided into two main groups (A females and B males) and control groups. Each one of A and B main groups were divided into two subgroups (A_1, B_1, A_2 and B_2), A_1 and B_1 group that orally administrated with 0.5ml formalin, while A_2, B_2 with 1 ml citric acid, finally two groups as control groups. The histological parameters which included tissue sections from kidney, liver, and duodenum, while the biochemical tests determined the level of AST (Aspartate Transaminase), ALT (Alanine Transaminase), creatinine, and urea in the serum of animals under study.

The results of kidney for both A_1 and B_1 after treating with formalin revealed increase in the diameter of all part of nephron (hypertrophy), intra glomerular vascular congestion between glomeruli capillaries and renal tubules, and renal corpuscle were shrinkages, while the histological changes in the kidney after treating with citric acid were also an increasing in the diameter of the renal corpuscle and clear hemorrhage between the renal corpuscle, aggregation of inflammatory cells and exfoliated of the epithelial layer of tubules.
The histological changes of the liver sections for both A_1 and B_1 after oral administration with formalin have been noted significantly increase in both the thickness of capsule and diameter of hepatocyte nuclei, also the occurrence of the cystic dilations filled with blood in different location of liver parenchyma and wide necrosis region, while the histological results after administrating of citric acid showed also a slightly increased in both thickness of capsule and diameter of hepatocyte nuclei, enlargement hepatocyte with prominent vacuolation in their cytoplasm with dilation in the sinusoids with hemorrhage.

The current results of histological structure in the wall of duodenum for both A_1 and B_1 after treating with formalin noted a significantly increasing in the thickness of the epithelial layer, several damages in mucosa layer and blood congestion, while the histological results after administration of citric acid showed a significant increase in the thickness of the epithelial layer, exfoliated the epithelial layer that covering the intestinal villi to the intestinal lumen and separated between layers.
The main biochemical results for males and females for both treated (formalin and citric acid) showed a significant increase in the levels of ALT, AST, also noted a significant increase in the level of creatinine and urea compared with control groups. However, several results differed slightly between females and males. Furthermore, formalin has more effects than citric acid for the most results.