

## **Abstract:**

Substances with different structures and chemical properties enter the body of living beings, including mammals, and in most cases have the ability to destroy and damage body tissues. Paraquat is a powerful poison and herbicide used to control weeds in the agricultural industry. Paraquat in the body causes the formation of toxic free radicals that cause serious damage to body tissues, including the liver. This damage is caused by oxidative stress, so it is necessary to use antioxidants to prevent compounds from oxidizing. By creating oxidative stress on the liver, this study tries to investigate the liver tissue in terms of stereology and histomorphometry and the effect of paraquat poison on the rat liver and to evaluate the protective effect of vitamin C on liver tissue changes. In this study, 36 pieces of adult rats were prepared in 6 different groups with an average weight of 200 grams, which includes the following groups.

Group 1 received physiological serum three times a week by gavage in the amount of one cc for each mouse. Group 2, paraquat at the rate of 20 mg/kg, group 3. They took vitamin C in the amount of 200 mg/kg three times a week by gavage. Groups 4, 5, and 6 were gavage with 12.5, 50, and 200 mg/kg of vitamin C and after one hour they were gavage with paraquat at 20 mg/kg. At the end of the 28th day, the mice were weighed and easily killed by inhalation with chloroform, and the liver of each mouse was transferred to formalin for histomorphometric and stereological studies, and after stabilization and performing hematoxylin-eosin, trichrome and Toledo Blue, prepared for study.

Prepared slides were used in hematoxylin-eosin staining to check histological parameters, histomorphometry and pathology. Also, the rest of the slides were stained with Toledin Blue, PAS, Trichrome, and Sudan Black, respectively, to check and measure the parameters of counting mast cells, carbohydrates, and the dispersion of collagen fibers and fat deposits in the liver.

In general, in this study, it can be stated that paraquat exerts its destructive effects on the liver tissue through oxidative stress and changes in the biological activity of hepatocytes, changes in liver fibrosis, creating edematous conditions in the liver and increasing necrosis in parenchymal cells. The studied parameters applied that in all cases the administration of vitamin C with low, medium and high doses in proportion to the increase in the dose moderated the aforementioned effects of paraquat. It should also be noted that the use of high dose vitamin C has no toxic effects on the liver, but it has increased the production of connective tissue in the liver tissue to some extent. In general, the present study showed that vitamin C has protective effects on the liver of rats under oxidative stress caused by paraquat, proportional to the dose, and this effect was greater in high dose vitamin C.

**Keywords:** Stereology, histopathology, liver, paraquat, vitamin C, rat