

## **Abstract:**

**Introduction:** Rat is the most commonly used mammalian research model to be developed for scientific research. Rat is used for research in genetics, psychology, medicine, and other fields of science. The brain is one of the organs forming the central nervous system that is completely composed of neural tissue. The central cavity of the brain is filled with cerebrospinal fluid and is connected to the central canal of the spinal cord. There are parts of the white matter around the central cavity of the brain and The outer part of the brain is mainly composed of gray matter. The brain is the center of intentional voluntary control and many non-core activities. The heart is a muscle in humans and animals that circulates blood through blood vessels in the blood circulation system. It provides blood, oxygen, and nutrients to the body, as well as helps to eliminate waste from metabolism (metabolism). Nitrite is a colorless gas oxide with NO chemical formula that is a free radical and an important intermediate substance in the chemical industry. In mammals such as humans, nitric oxide is an important molecule in cell signaling that is involved in many physiological and pathological processes. It has a vasodilator and has a short half-life in blood for a few seconds. Low levels of nitric oxide are important in protecting organs such as the liver from ischemic injury. Cadmium is one of the few elements that have no structural role in the human body. This element and solution of its compounds are even very low, toxic and stored in organs and the environment. Cadmium inhaling rapidly in the respiratory tract and the kidneys causes problems that can be fatal.

**Target:** The main objective of this study was to measure the amount of nitrate and nitrite in the tissues of the brain, heart, kidney and liver Also, histopathological lesions due to cadmium poisoning in dams and measurement of liver enzymes.

**Materials and Methods:** In this study, 20 adult male Wistar rats weighing from 220 to 231 grams were used. The rats were divided into 2 groups. 1) Healthy group as a negative control 2) The cadmium poisoning group as a positive control. To cause poisoning 2 mg / kg Cadmium chloride solution was injected intraperitoneally for 16 days to rats every 48 hours. It has been shown that this dose of cadmium causes tissue damage. From 24 to 48 hours after poisoning, samples were slaughtered humanely and then samples from the brain, heart, kidney, liver and blood samples were collected. To measure the nitrite and nitrate contents, the tissues were washed with physiological serum and freeze in a negative freezer. After 48 hours, the samples were homogenized and then centrifuged and we removed the superficial fluid and measured the nitrite oxide protocols charts were plotted using spss software. We centrifuged the blood and isolated the serum and the levels of AST and ALT enzymes were measured to confirm poisoning. To view the tissue changes induced by cadmium toxicity, tissue samples were stable in 10% formalin and paraffin sections prepared with standard Hemateoxilin-Eosin (H & E) and specific periodic acid shifts (PAS) staining and Photomicrographs were viewed with a digital camera's Olympus microscope.

**The result and the discussion:** Nitric oxide levels decreased in the brain, kidneys and liver, but in the heart it increased nitric oxide levels ( $p < 0.05$ ). The levels of ALT and AST enzymes were increased in the cadmium toxicity group. Cadmium also caused tissue damage contains: in the heart tissue Causes the breakdown of

the membrane of the epicardial and endocardial cells, voidation of the cytoplasm of the cellular enclosure and necrosis of the nuclei, muscle inflammation, irregularities of the muscles, destruction of the connective tissue, vacuolation of the sarcoplasm, necrosis of the nuclei The muscle cell was the destruction of the sub-endothelium of the heart-feeding vessels. in the brain tissue, brain swelling, brain dilatation, and neuronal tissue growth have been reported. In the kidney, the destruction of the glomeruls, the destruction of the epithelium of the Bowman capsule, the destruction of the epithelium of the tangled ducts near, far, lumbar bundle, the destruction of the blood vessels, the destruction of the epithelium of the collecting tubes and the Bellini or Papillary duct. The results of this study were matched by other studies of the elements of heavy elements Except for increasing the amount of nitric oxide from the heart due to cadmium poisoning.

**Keywords: nitrate, nitrite, brain tissue, heart tissue, kidney tissue, liver tissue, rat, poisoning, cadmium**



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**The determinate measure of nitrite and nitrate in  
brain and cardiac tissue of rats poisoning with  
Cadmium**

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