

Effects of cadmium acetate contaminated drinking water on vital organs: A histopathological and biochemical study

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ABSTRACT

Cadmium (Cd) is a heavy metal with various human exposure sources. It accumulates in the liver, forming a complex with metallothionein protein and progresses to other organs. As a heavy metal, cadmium can replace calcium and other divalent ions and disturb their cascades, ultimately affecting the vital organs. Since cadmium acetate (CA) is considered more lethal than other Cd compounds, the current study examines the effect of different concentrations of CA doses in drinking water for different exposure times in murine models (*Mus musculus*). After the exposure period, the murine models were then examined histopathologically and biochemically. The histopathological examination of the heart, liver, and kidneys of the experimental group showed extensive degenerative effects. Atomic absorption spectroscopy was used to determine the quantity of cadmium in serum, kidney, and hepatic tissues. Sodium dodecyl sulfate-polyacrylamide gel electrophoresis analysis of hepatic proteins, especially metallothionein, directly related to Cd administration. The biochemical parameters, including creatine kinase, alanine aminotransferase, aspartate aminotransferase, total proteins, glucose, urea, uric acid, and creatinine, were also analyzed. After thorough histochemical and biochemical analysis, it was concluded that even low dose exposure of CA is hazardous to murine models with damaging effects.

KEYWORDS

Biochemistry; Cadmium toxicity; Histopathology; Kidney functioning; Liver enzymes; Metallothionein

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