

Demonstrating adverse effects of a common food additive (Sodium sulfite) on biochemical, cytological and histopathological parameters in tissues of albino Wister rats

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ABSTRACT

Sulfites have been used as preservatives in food and drugs. The use of sulfite-containing compounds on fruits and vegetables was banned because of potential allergic reactions, and those suffering from asthma are at elevated risk of sulfite sensitivity. The present study investigated the effect of daily administration of sodium sulfite (Na₂SO₃) on female albino rats at doses of 200, 500, and 1000 ppm for 12 weeks. Impacts on growth, blood picture, genotoxic effect, some biochemical parameters and histopathological characteristics were examined. The results revealed that Na₂SO₃ causes a significant decrease in body weight, red blood cells (RBC) count, hemoglobin (Hb) concentration, hematocrit (HCT) value, white blood cells (WBC), and glucose level, while there was a significant increase in serum activity of aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphatase (ALP) as well as the serum urea and creatinine levels in the treated rats. Cytogenetic analysis showed various types of chromosomal aberration such as fragments, chromosome ring, chromatid break, stickiness of chromosome, end to end association, translocation, and centric fusion. Histopathological examination of the experimental animals indicated little sinusoidal dilatation in rats treated with 200 ppm of Na₂SO₃. Hepatic vacuolation, large sinusoidal dilatation, degenerative changes and cellular congestion were shown in liver of rats treated with 500 and 1000 ppm of Na₂SO₃ when compared to the control group. Administration of Na₂SO₃ to rats exhibited serious effects on both liver and kidney cells.