



Regulatory Mechanisms in Biosystems

ISSN 2519-8521 (Print)
ISSN 2520-2588 (Online)
Regul. Mech. Biosyst.,
2024, 15(4), 755–759
doi: 10.15421/0224109

Effect of ibuprofen on the submandibular salivary gland in rats: Histological and biochemical study

Abstract

This study aims to assess the histological and biochemical effects of ibuprofen on the submandibular salivary gland in rats.

The study provides detailed data on ibuprofen's impact on oxidative stress levels and structural changes in the salivary gland. A total of

15 male rats were used, divided into three groups: the control group, left untreated; the first group, which received a moderate dose of

ibuprofen (200 mg/kg/day); and the second group, which received a higher dose of ibuprofen (400 mg/kg/day). Ibuprofen was administered

orally for 3 weeks. The histological results showed that the group administered ibuprofen at 400 mg/kg exhibited apoptosis

and necrosis in the granular convoluted tubule cells and degeneration of the striated duct cells with sloughing. The biochemical analysis

indicated a significant increase in caspase-3 concentration in the 400 mg/kg ibuprofen group compared to the control group ($0.398 \pm$

0.001). Additionally, this high-dose group exhibited a marked decrease in total antioxidant capacity (TAC) levels (30.1 ± 1.1) compared

to the control group, indicating that a high ibuprofen dose negatively affects the system's total antioxidant capacity. In conclusion,

high doses of ibuprofen may cause damage to salivary gland tissue and the body's antioxidant system, as well as increase programmed

cell death, raising the likelihood of cellular and tissue damage. It is important to be careful when taking amounts of ibuprofen

for a long time period because it can cause health problems related to the digestive system in at risk patients. Therefore using other

treatments alongside ibuprofen might reduce any effects on tissues.