

## Morphological alteration in mitochondria following diclofenac and ibuprofen administration.

### ABSTRACT

This study was conducted to identify and to compare the mitochondrial morphological alterations in livers of rats treated with various doses of diclofenac and ibuprofen. Hundred and forty-four male Sprague Dawley rats were dosed with 3, 5 and 10 mg kg<sup>-1</sup> diclofenac and ibuprofen in saline via intraperitoneal injection for 15 days. The control group was administered with saline in a similar manner. Four rats were euthanised every 3 days until day 15. While 200 mg kg<sup>-1</sup> diclofenac and ibuprofen-treated rats (n = 4) were euthanized 10 h post-treatment. The livers were removed, cleaned and a section across the right lobe was taken and fixed in 4% (v/v) glutaraldehyde for electron microscopy analysis and the remaining samples were kept at -80°C for Western blot analysis. Five milligram per kilogram and 10 mg kg<sup>-1</sup> diclofenac-administered rats for 15 days revealed the presence of enlarged mitochondria, irregular and ruptured mitochondrial membranes. While rats administered with 10 mg kg<sup>-1</sup> ibuprofen also showed the presence of mitochondria with irregular membrane structure and ruptured membranes. Western blotting analysis of mitochondrial fractions revealed the expression of cytochrome c in all samples and complete absence of cytochrome c expression in the cytosolic fraction of all samples after day 15. Analysis in 200 mg kg<sup>-1</sup> diclofenac and ibuprofen-treated groups, revealed expression of cytochrome c in both mitochondrial and cytosolic fractions. This observation indicates that both diclofenac and ibuprofen may alter the morphology of mitochondria, leading to cytochrome c release into the cytosol. Further studies needs to be conducted to investigate on the activity of the mitochondria following both treatments.

**Keyword:** Cytochrome c; Hepatotoxicity; Mitochondria; Non-steroidal anti-inflammatory drugs.