THE EARLY TISSUE ALTERATION INDUCED BY DIFFERENT OXIMES IN RATS

Vesna Jačević 1,2,3, Eugenie Nepovimova 3, Kamil Kuča 3

1 National Poison Control Centre, Military Medical Academy, Crnotravska 17, 11000 Belgrade, Republic of Serbia
2 Faculty of Medicine of the Military Medical Academy, University of Defense, Pavla Jurišića Šturma 1, Belgrade, Republic of Serbia
3 Department of Chemistry, Faculty of Science, University of Hradec Kralove, Rokitanskeho 62, 500 03 Hradec Kralove, Czech Republic

Newly developed oximes, when taken in overdoses and sometimes even when introduced within therapeutic ranges, may injure the different organs. In this work, we focused our attention on an investigation of morphological lesions produced by increasing doses of oximes. Asoxime, obidoxime, K027, K048, and K075 were selected as experimental reactivators. The whole experiment was conducted on Wistar rats. All rats were sacrificed 24 hrs and 7 days after single im application of 0.1 LD₅₀, 0.5 LD₅₀ and 1.0 LD₅₀ of each reactivator. Tissue alterations were carefully quantified by semiquantitative grading scales - cardiac, diaphragm, muscular, pulmonary, gastric, hepatic and splenic damage score, respectively. Morphological structure of different tissues treated with 0.1 LD₅₀ of all reactivators were similar to those evaluated in the control groups. Focal and reversible degenerative and vascular changes, were established in tissue samples after treatment with 0.5 LD₅₀ of asoxime, obidoxime and K027 (p < 0.01 vs. control group). Acute alterations were developed in tissue samples within 7 days following treatment with 0.5 LD₅₀ and 1.0 LD₅₀ of all reactivators. The most severe tissue alterations were found in rats treated with 0.0 LD₅₀ of K048 and K075 (p < 0.001 vs. control and asoxime group, respectively). Our results showed that all AChE reactivators given by a single, high, unitary dose regimen, have adverse effect not only on the main visceral and muscular tissues, but on the whole rat as well, but the exact cause-effect relationship causing cellular injury remains to be established in further investigation.

Keywords: reactivator; oximes; toxicity; pathohistology; tissue injury