COMPARATIVE ASSESSMENT OF TOXICITY BIOMARKERS TO XENOBIOTICS IN HUMANS AND RATS EXPOSED TO LEAD NITRATES
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Abstract

Water is one of the basic needs for human beings. The life of humans requires healthy sufficient water. But when it contains toxic matter water becomes a source of death. In this frame, several studies carried out have shown that populations of Ahomey and Houédo in Sô-Ava in Benin were exposed to toxic matter among which nitrites and lead, thus exposed to the methemoglobinemia and lead poisoning. Another study proved the existence within the respective population of some characteristic signs in these affections. The present study aimed at estimating the health impact of toxicants identified in the drinking water and comparing them to those observed in animals. Blood and urinary sampling carried out in 31 residents in the range of 15 to 80 years old were submitted to biochemical and hematological examinations. The results did not show a significant disturbance at the level of blood biomarker. However, renal inflammation was noticed with the investigated. To verify this hypothesis, another experimental study was conducted on 30 male wistar rats. Rats were exposed to lead and nitrates, the most toxic two substances identified in drinking water of these localities. Rats were daily poisoned per os with six different doses of lead nitrate for 3 weeks. Blood and organs collection were carried out after the sacrifice of the rats at the end of the treatment and analyzed for physiological, biochemical, histological and hematological changes. The results showed a significant increase in body weight ratios for liver, and a non-significant increase in body weight ratios for spleen and kidney in poisonous rats compared to control. The increase was more pronounced with increasing doses. The same observation was noticed with levels of glycemia and transaminases in rats in contrast to what was observed with residents of Sô-Ava. The histological result displayed rare cellular changes. That proved that living organisms could adapt to low doses of toxic substances over a long period.

Keywords: biomarkers, residents of Sô-Ava, rats, nitrates, lead.