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Histopathological Changes in Chronic Low Dose Organic Arsenic Exposure in Rats Kidney (Article) (Open Access)

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Abstract

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INTRODUCTION: Exposure to environmental arsenic remains a major public health challenge. Human is exposed to arsenic from groundwater as a result of anthropogenic activities. Chronic exposure to inorganic arsenic has been linked with multiple medical conditions. Therefore, many agricultural countries have shifted the use of inorganic to the organic -based herbicide, monosodium methylarsonate (MSMA). However, with increasing numbers of chronic kidney disease of unknown etiology (CKDu), chronic exposure to herbicide is believed as one of the potential explanations. To date, studies on chronic effects of organic arsenic on the kidney are limited. Therefore, this study aimed to investigate the effect of chronic oral organic arsenic exposure on the rat 's kidney . MATERIALS AND METHOD: Thirty-six Sprague Dawley rats were randomly divided into treatment and its corresponding control groups according to the duration of observations either 2, 4 or 6 months. Both groups were subdivided into three subgroups, each with six animals per subgroup. The treatment groups were given oral MSMA at 63.20 mg/kg body weight, while control groups received distilled water. At the end of each duration, blood was collected for the renal profile, urine for neutrophil gelatinase-associated lipocalin (NGAL) marker, and kidney tissues were harvested for arsenic level measurement and histological analysis. RESULTS: Arsenic level and urinary NGAL were higher in all treatment groups than its corresponding control groups. Histological findings showed progressive pathological changes in the glomeruli and proximal tubules. CONCLUSIONS: Chronic oral exposure to low dose organic arsenic has demonstrated evidence of kidney injury in rats .

SciVal Topic Prominence

Topic: Monomethylarsonic Acid | Sodium Arsenite | Arsenous Acid Derivative

Prominence percentile: 98.802

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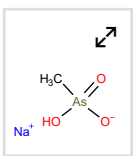
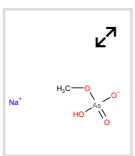


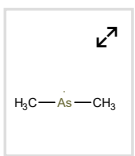
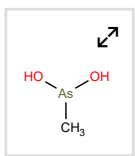
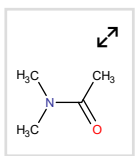

Author keywords

chronic exposure | glomerular and proximal tubule injury | Low dose organic arsenic | monosodium methyl arsenate

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