

LIGHT MICROSCOPIC STUDY OF HEPATO-RENAL  
LESION & THEIR REVERSIBILITY AFTER LONG TERM  
ADMINISTRATION OF ARSENIC TRIOXIDE IN  
SPRAGUE DAWLEY RATS

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## Abstract

**Background:** Arsenic is widely distributed in nature in the form of chemical compound or metalloids. It is found to be mixed with drinking water of shallow natural reservoirs. Over 100 million people of the world are at risk of exposure to arsenic. It causes variety of pathologic conditions including cutaneous and visceral malignancies. 8-hydroxy-2-deoxyguanosine (8-OHdG) is one of the major reactive oxygen species, widely accepted as a sensitive marker of oxidative DNA damage. The reversibility in organ damage after arsenic exposure is unclear.

**Objective:** To study the histomorphology and 8-OHdG expression in the liver and kidney of rats exposed to long term arsenic and observe its reversibility after arsenic withdrawal.

**Materials and method:** 36 male Sprague-Dawley rats were divided into 6 groups: one control and five Arsenic groups. The arsenic group rats were given arsenic trioxide solution at 3mg/kg body weight/day by gavage feeding for 12 weeks. Then arsenic ingestion was stopped and the rats were sacrificed after 2, 4, 8 and 12 weeks post-cessation of treatment. The tissues were embedded into paraffin blocks, sectioned and stained with Hematoxylin&Eosin and immunohistochemically with 8-OHdG primary antibody.

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## **1.0 INTRODUCTION**

Arsenic is present naturally in the environment, and can be a poison that may be taken intentionally or unintentionally by humans. Arsenic is also used in pesticides, herbicides and wood preservatives (Ng, Wang, & Shraim, 2003). Humans accidentally ingest arsenic contaminated drinking water. This occurs in places such as West Bengal, Bangladesh and China (Ratnaike, 2003), where the ground water is heavily polluted with arsenic. The ingested arsenic affects the liver, kidney, skin and brain (Ng et al., 2003). It leads to among other diseases, cancer of the affected organ (Dong & Luo, 1993). A lot of resources were spent to treat patients with arsenic poisoning. The reversibility of arsenic poisoning is uncertain. This study aims to investigate the reversibility of arsenic poisoning in rats following a determined withdrawal period.

## **2.0 LITERATURE REVIEW**

### **2.1 Arsenic**

Arsenic is a metalloid element, which forms a number of poisonous compounds. It is widely distributed throughout the earth's crust (Sakurai, 2003). It is said that ingestion of inorganic arsenic can cause both noncancerous health effects and internal and external cancer in human body (Anawar, Akai, Mostofa, Safiullah, & Tareq, 2002). The most common inorganic trivalent arsenic compounds are arsenic trioxide and sodium arsenite, where most pentavalent inorganic compounds are sodium arsenate,