

**Original Article**

**Histological and immunohistochemical assessment of the cerebral cortex following potassium bromate intoxication in wistar rats**

Agnes A. Nwakanma, Moses B. Ekong, Chukwuebuka O. Elemuo, Mokutima A. Eluwa, Igwe J. Okafor, Ann C. Idaguko

---

**ABSTRACT**

Potassium bromate (KBrO<sub>3</sub>) is classified as mutagenic and carcinogenic although used in food and cosmetics industries, and also found in drinking water as a by-product of disinfection. Industrial pollution of drinking water and its ability to cross the blood-brain barrier lead to the investigation of its effect on the cerebral cortex. Twenty adult Wistar rats with average weight of 200 g were divided into four groups designated as 'A' for the control group, and 'B, C and D' for the test groups, with each group having five rats. All animals had free access to feed and water. The control group did not receive any treatment, while the test groups received 0.1 mg/kg, 0.2 mg/kg, and 0.3 mg/kg of KBrO<sub>3</sub> respectively, for 28 (twenty-eight) days through orogastric tube. On the 29th day, all animals were anaesthetized using ketamine hydrochloride (100 mg/kg, i.p.), and the brains were perfused transcardially with 0.9 % buffered saline followed by 10 % buffered formalin. The brains were removed and further preserved in 10% buffered formalin. The cerebral cortex was dissected, processed for paraffin sectioning and stained for histological study using Haematoxylin and Eosin technique and astrocytes immunolabelling with glial fibrillary acidic protein (GFAP). Results revealed that KBrO<sub>3</sub> caused histological alterations and degeneration of neurons and astrocytes in the KBrO<sub>3</sub> test groups especially the high dosage groups. These effects were dose dependent, and hence the degeneration of cells may lead to the functional impairment of the cerebral cortex.

Keywords: Cerebral cortex, histology, potassium bromate, Glial fibrillary acidic protein, Wistar rat

---