

## Effect of Long-Term Boron Exposure on Liver Structure of Adult Male Albino Rats and a Possible Role of Vitamin C

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**Abstract :** Background: Boron is a naturally occurring agent and an essential trace element of human, animals and higher plants. It is released in the form of boric acid (BA) that is water soluble and biologically available. Its largest uses are in glass, detergents, agriculture, leather tanning industries, cosmetics, photographic materials, soaps and cleaners. Human consume daily few milligrams in the water, fruits and vegetables. High doses of boron had been recorded to be developmental and reproductive toxin in animals(Only few studies on human had investigated the health effects associated with exposure to boron. Vitamin C is a major water soluble non-enzymatic antioxidant, acts to overcome the oxidative stress. Aim of the work: However , the liver is exposed to toxic substances that are absorbed, degraded or conjugated there were little information exists about the effects of boron that it would specifically have in the liver tissue of experimental rats. So the present work aimed to study the effects of long-term boron ingestion on histological structural of the liver of adult male albino rats and to evaluate the protective role of vitamin C against induced changes. Material and Methods: 30 adult male albino rats were divided into 3 equal groups; Group I: control, Group II: recieved drinking water containing  $55 \times 10^{-6}$  gm boron/liter for 90 days and Group III: recieved vitamin C (200mg/Kg.B.W) orally concomitant with boron for the same period. liver specimens were processed for light and electron microscopic(TEM) study. Results: Examination of the liver sections of group II revealed foci of severe dilatation and congestion of central and portal veins with mononuclear cellular infiltration and hepatocellular vacuolation. Increased collagen deposition specially around the portal areas. Marked electrolucent areas in the cytoplasm, heterochromatic nuclei and destroyed organelles of the hepatocytes. Apoptotic cells were observed and decreased lipid content of ito cells. In Group III the co administration of vitamin C improved most of the structural changes of the hepatocytes, Ito cells, increased binucleated cells and decreased collagen fibers deposition. Conclusion: Thus, the long term exposure to boron, induced histological changes on the structure of liver. The co administration of vitamin C improved most of these structural changes.

**Keywords :** boron, liver, vitamin C, rats

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