The hepatotoxic effects of 4-nonylphenol on African catfish (Clarias garepinus): Physiological and histological study

Nasser Sayed Abou Khalil Mahmoud Abd-Elkareem

Abstract:

4-Nonylphenol (NP) toxicity in fish attracts much attention due to its ability in targeting several organs; however, the researches regarding its potential hepatotoxicity are conflict and still require further investigation. Therefore, the objective of this study is to focus on this issue from the histo-physiological point of view using NP intoxicated African catfish (Clarias garepinus) as a model of hepatotoxicity. 12 adult fish (6 per group) were divided into two groups; the first was considered as control and the second was exposed to NP dissolved in water at a dose of 0.1 mg/kg BW for 3 weeks. A significant reduction in the hepatic alanine aminotransferase, asparatate aminotransferase and lactate dehydrogenase levels was observed in NP exposed fish. Concerning the oxidant/antioxidant balance, a significant depletion in superoxide dismutase, catalase and glutathione peroxidase was found along with a significant elevation in total peroxide and malondialdehyde. The histopathological examination of the liver tissue revealed that NP had marked hepatotoxic effects including hepatitis, centrilobular and focal hydropic and fatty degeneration, fatty change (steatosis), apoptosis of hepatocytes and necrosis of endothelial cells, hepatic coagulative necrosis, and nuclear alterations. Depletion of the glycogen and increased pigments (lipofuscin and hemosiderin) content in the hepatocytes were also recorded. Hemosiderosis and proliferation of the connective tissue around the blood vessels, branches of bile ducts and in the portal areas were also observed. In the light of these findings, it was concluded that NP has a well defined hepatotoxic impact in Clarias Gariepinus paving the road towards other studies investigate other detrimental cyto-physiological influences of this aquatic pollutant.

Keywords:

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