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Hepatotoxicity of Microcystin-LR in Wistar Rats**Abeyesiri H.A.S.N.^{1,2}, Manage S.P.¹, Wanigasuriya J.K.P.³, Suresh T.S.⁴, Beneragama D.H.⁵,
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Abstract

Microcystins produced by cyanobacteria has been identified as a potent hepato and neuro toxicant to human and livestock. The present study was aimed to determine the possible hepatotoxic effects of MC-LR on mammals using male Wistar rats as an animal model. An ethically accepted experimental protocol was used in the study enrolling thirty-five rats separated into five groups (n=7 in each). Test groups were orally treated with different doses of MC-LR (0.105 µg/kg, 0.070 µg/kg and 0.035 µg/kg). Well water contaminated with MC-LR, collected from CKDu prevalent Padaviya area (0.091 µg/kg) was given to the environmental exposure group and distilled water was administered to the control group. Body weight was measured once a week. The total duration of exposure of the rats was 90 days. Blood samples were collected at 0,7,14,28,42,60,90 days. Aspartate Amino Transferase (AST) and Aspartate Alanine Transferase (ALT) were analyzed from each blood sample. At the end of the experimental period, liver samples were collected for histological examination following the accepted protocol. The mean bodyweight of the rats in treated groups of gradually increased until the twelfth week and decreased thereafter. A significant decrease in body weight of rats with MC-LR exposure at 13 and 14 weeks was seen compared to the control group ($p=0.000$). The absolute and relative weights of livers of the treated groups were significantly lower than the control group ($p<0.05$). The highest serum AST and ALT levels were observed in rats that were given MC-LR at the dose of 0.105 µg/kg. The hepatocytes showed mild changes including sinusoidal congestion and vascular congestion with lobular inflammation, focal haemorrhage and marked microvesicular steatosis in 0.105 µg/kg group. Mild lobular inflammation, focal haemorrhage, perivenular inflammation, prominent kupffer cells and focal microvesicular steatosis were observed in 0.091 µg/kg group. Mild lobular inflammation was seen in 0.070 µg/kg group. In conclusion, this study demonstrated that the long term MC-LR exposure can cause hepatotoxicity in Wistar rats.

Keywords: Microcystin-LR (MC-LR), Wistar rats, AST, ALT, Histopathology