

The Short Term Effect of Cyanobacterial Toxin Extracts on Mice Kidney

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Chronic kidney disease of unknown origin (CKD-U) in Sri Lanka shows clustering of patients around water reservoirs, and similarities in incidence over time in CKD-U and alcoholic liver disease in the North Central Region, which indicates the possibility of a common aetiological agent. The aim of this study was to find the short term effects of extracts of cyanobacteria isolated from the reservoirs and canals of the high prevalence area of CKD-U on mice kidney.

Diluted extracts of *Microcystis*, *Cylindrospermopsis* and *Lyngbia* blooms were fed to groups of 5, 7 and 10 mice respectively for a week. Another 5 mice were fed for one week with diluted extracts of microcystis bloom, followed by 2 weeks of normal water. The control group of mice (n= 10) was given normal water for a week. Cyanobacterial extracts were analyzed for microcystin, deoxy-cylindrospermopsin (DCYN) and cylindrospermopsin (CYN).

Acute tubular necrosis (ATN) was detected in 5/5 mice fed with extracts of *Microcystis* bloom that contained microcystin (65µg/l), DCYN (2.1 µg/l) and CYN while 2/5 mice had ATN when this extract was followed with normal water for 2 weeks. One out of seven mice fed with *Cylindrospermopsis* bloom that contained DCYN (29.5 µg/l) and CYN (0.7 µg/l) and 6/10 mice fed on *Lyngbia* bloom containing CYN (1.7 µg/l) and DCYN (0.5 µg/l) had ATN. All control mice had normal tubules.

The results show the ability of the cyanobacterial extracts to induce ATN in mice in the given concentrations. The ability of the kidneys to recover is suggested by the less frequent abnormalities seen after normal water has been supplied for 2 weeks post-*Microcystis* poisoning. As DCYN was available in all 3 extracts causing ATN, the ability of DCYN on its own to induce tubular necrosis even at low concentrations need to be investigated.