Chlorinated river and lake water extract caused oxidative damage, DNA migration and cytotoxicity in human cells.


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Consumption of chlorinated drinking water is suspected to be associated with adverse health effects, including mutations and cancer. In the present study, the genotoxic potential of water from Donghu lake, Yangtze river and Hanjiang river in Wuhan, an 8-million metropolis in China, was investigated using HepG2 cells and the alkaline version of the comet assay. It could be shown that all water extracts caused dose-dependent DNA migration in concentrations corresponding to dried extracts of 0.167-167 ml chlorinated drinking water per ml medium. To explore whether the intracellular redox status is regulated by chlorinated drinking water, we determined lipid peroxidation (LPO) and depletion of reduced glutathione (GSH). The malondialdehyde (thiobarbituric acid (TBA)-reactive aldehydes) concentration increased after chlorinated drinking water treatment of HepG2 cells in a dose-dependent manner, the GSH content decreased. The activity of lactate dehydrogenase (LDH) increased in chlorinated drinking water treated HepG2 cells indicating cytotoxicity. In accordance with former studies which dealt with in vivo and in vitro micronucleus induction the present study shows that chlorinated drinking water from polluted raw water may entail genetic risks.

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