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Modulation of mercuric chloride by the combined treatment of N-acetyl cysteine and selenium: A protective approachDeepmala Joshi^{1,2}, Sadhana Shrivastava², Sangeeta Shukla² and Sunil Srivastav¹¹Deen Dayal Upadhyaya Gorakhpur University, India²Jiwaji University, India

Mercury is ubiquitous in the environment and is inevitable in both human and animals to avoid its exposure in toxic forms of mercury on a regular basis. The channel news Asia, Singapore reported that 18 recalled beauty products contains mercury and other potent ingredients exceeded permissible limit by more than 27,000 times. The aim of present study describes the protective effect of selenium either alone or in combination with N-Acetyl Cysteine (NAC) against acute mercuric chloride poisoning. The experiment was carried out in male albino Sprague Dawley rats (n=30) which was divided into 5 groups. Group 1 served as control. Groups 2-5 were administered mercuric chloride (HgCl_2 : 12 $\mu\text{mol/kg}$, i.p.) once only, group 2 served as experimental control. Animals of groups 3, 4 and 5 were received N-acetyl cysteine (NAC: 0.6 mg/kg, i.p.) and selenium (Se: 0.5 mg/kg, p.o.) and NAC with Se in combination. Acute HgCl_2 toxicity caused significant rise in serum AST, ALT, SALP, LDH, albumin, bilirubin, GGT, TG, cholesterol, protein, urea, creatinine, uric acid and BUN content. Animals of toxicant exposed group also showed significantly higher mercury content in liver and kidney, significant rise in lipid peroxidation level with concomitant decrease in reduced glutathione content and the antioxidant enzyme activities of superoxide dismutase and catalase after HgCl_2 exposure. Results of the present investigation clearly showed that the combination therapy with NAC+ Se provides maximum protection against mercury toxicity than mono-therapy by preventing biological membrane from oxidative damage and metal mediated free radical attacks.

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