Adriamycin-induced oxidative stress is prevented by mixed hydro-alcoholic extract of Nigella sativa and Curcuma longa in rat kidney

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Abstract

Introduction: Inflammation and oxidative stress is considered to have a crucial role in induction of nephropathy. *Curcuma longa (C. longa)* and *Nigella sativa (N. sativa*) have anti-inflammatory and antioxidant effects. This study was designed to investigate the effect of mixed hydro-alcoholic extract of *N.sativa* and *C. longa* on the oxidative stress induced by Adriamycin (ADR) in rat kidney.

Methods: The animals were divided into 6 groups: control (CO), ADR, Adriamycin+ Vitamin C (ADR+VIT C), *C. longa* extract+ Adriamycin (C.LE+ADR), *N. sativa* extract+ Adriamycin (N.SE+ADR) and *C. longa* extract+ *N. sativa* extract + Adriamycin (N.S+C.L+ADR). ADR (5mg/kg) was injected intravenously, whereas VITC (100mg/kg) and extract of *C. longa* (1000mg/kg) and *N. sativa* (200mg/kg) were administrated orally. Finally, the renal tissue, urine and blood samples were collected and submitted to measure of redox markers, osmolarity and renal index.

Results: The renal content of total thiol and superoxide dismutase (SOD) activity significantly decreased and Malondialdehyde (MDA) concentration increased in Adriamycin group compared to control group. The renal content of total thiol and SOD activity significantly enhanced and MDA concentration reduced in treated-mixed extract of *C. longa* and *N. sativa* along with ADR group compared to ADR group. The mixed extract did not restore increased renal index percentage induced by ADR. There also was no significant difference in urine and serum osmolarity between the groups.

Conclusion: Hydro-alcoholic extracts of *N.sativa* and *C.longa* led to an improvement in ADR-induced oxidative stress and mixed administration of the extracts enhanced the aforementioned therapeutic effect.

Key words: *Nigella sativa*, *Curcuma longa*, Adriamycin, Oxidative stress, Kidney