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Is Methanolic Seed Extract of *Nigella Sativa* Truly Protective against Toxic Chemicals or Harmful to Tissues?

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ABSTRACT

Edible plant materials with medicinal properties have been used for treating various diseases for many centuries in folk medicine. Recently, the role of food or medicinal plants in human health has received considerable attention. We investigated the protective effects of methanolic seed extract of *Nigella sativa* (MENS) against cadmium-induced biochemical and histomorphological alterations in heart, kidney and liver tissues of albino rats. Phytochemical analyses of MENS were carried out using standard methods. Twenty five (25) male albino rats, weighing (200 ± 20g), were randomly grouped into five groups: A, B, C, D, and E with Group B (Negative Control; $CdCl_2$, 5 mg/kg), group C ($CdCl_2$ + MENS, 300 mg/kg), group D ($CdCl_2$ + MENS, 600 mg/kg), and group E ($CdCl_2$ + Vitamin C, 200 mg/kg) respectively for 14 days. Group A (Normal control) received no administration. Serum biochemical assays of AST, LDH, CK-MB, Na^+, K^+, creatinine, urea, total bilirubin, ALT and ALP were done using standard laboratory methods. The Heart, kidney and liver were harvested for histopathological analyses. Phytochemical analysis of *Nigella sativa* revealed abundant presence of alkaloids and flavonoids (+++); moderate presence of tannins and phenols (++). Serum biochemical results showed a significant elevation in the levels of AST, LDH, CK-MB, K^+, creatinine, urea, total bilirubin, ALT and ALP in the negative control group when compared with normal control group ($p<0.05$, $p<0.01$ or $p<0.001$). These were however significantly ameliorated in the groups that received MENS (300 mg/kg or 600 mg/kg, oral) or Vitamin C (200 mg/kg, oral). Interestingly, we observed that the protective effect was not dose-dependent, as low dose MENS (300 mg/kg), showed better protection than the high dose MENS (600 mg/kg). Histopathological results were clearly concomitant and supportive of the biochemical results. The results offer scientific evidence that in low doses as used in foods (spice), *Nigella sativa* seed has no harmful effects and could very well be potentially tissue-protective against harmful chemical toxins like cadmium or drugs; however higher doses or prolonged use of MENS in herbal preparations calls for caution in patients with underlying cardiac, kidney or liver dysfunction.

Keywords: Anti cardiotoxic, Cadmium, *Nigella sativa*, Medicinal food, Antinephrotoxic, Ethnopharmacology, Antihepatotoxic

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