Antioxidant and nephro-protective effect of Juglans regia vegetable oil against lead-induced nephrotoxicity in rats and its characterization by GC-MS

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Abstract

Lead (Pb) intoxication remains a major health hazard causing various deleterious effects especially on renal and hematologic system. The current study elucidated the potential protective effect of JRVO against nephrotoxicity induced by lead. Male rats were randomly divided into three groups: group one (control) received ad libitum distilled water and 1 mL of saline solution (0.9 %) given by intra-peritoneal (i.p) injection, group two (Pb) was kept on tap distilled water and animals were i.p, injected daily with lead every two days from day five until day ten, namely the sacrifice day, and group three (Pb+J) was administered by intra-peritoneal injection of Pb with the same dose and same way with Group two, while JRVO extract was administered daily by gavage during ten days. The exposure of lead reduced the number of red and white blood cells. Besides, plasma biomarkers (urea, uric acid, creatinine, LDH and ALP) levels were reduced. Lipid and protein per-oxidations increased and objectified by high TBARS and PCOs levels, while glutathione peroxidase, superoxide dismutase and catalase activities showed a significant decline after ten-day treatment. Conversely, the JRVO prevented kidney biomarker changes by improving hepatotoxicity induced by lead as evidenced by restoring the biochemical markers cited above to near normal levels. Kidney histoarchitecture confirmed the biochemical parameters and the beneficial role of JRVO. It can be concluded that the administration of JRVO alleviates Pb-induced toxicity, thus demonstrating its potent antioxidant efficacy.

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