

بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / سلوي محمود عقل

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

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Faculty of Women for Arts, Science & Education Department of Zoology

The Potential Role of Mesenchymal Stem Cells and *Beta vulgaris* (Beetroot) in the Treatment of Cisplatin-Induced Nephrotoxicity in Adult Male Rats.

A thesis submitted for the degree of Ph.D. in Zoology (Histology and Histochemistry)

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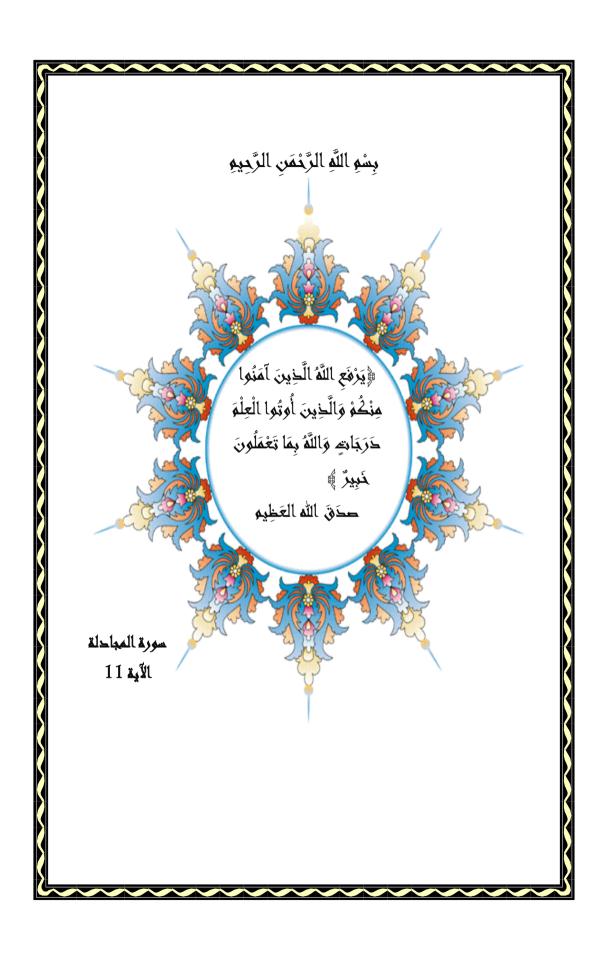
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Abstract

Cisplatin (Cis) is the most effective antineoplastic however, its common adverse effect nephrotoxicity. Mesenchymal stem cells (MSCs) have the ability to home to damaged tissue sites, differentiate into tissue-specific cells and producing growth factors. MSCs immunomodulatory properties and regard have antiapoptotic and anti-inflammatory. Beta vulgaris or beetroot (Br) is used as an antioxidant, anti-inflammatory therefore, it presents protection against the oxidative stress and inflammation. The current study was established to investigate whether MSCs and Br, either alone or in combination, could alleviate Cis- induced nephrotoxicity in adult male rats.

Sixty male albino rats were divided into six groups. Group 1 (control): Rats received orally 0.9% saline for 6 weeks. Group 2 (Br): Rats received Br (500 mg/kg b.wt./day) orally for 6 weeks by oral intubation. Group 3 (Cis): Rats received Cis (7 mg/kg b.wt.) intraperitoneally once a week for two weeks. Group 4 (Cis + Br): Rats received Cis then treated with Br (500 mg/kg b.wt./ day). Group 5 (Cis + MSCs): Rats received Cis then treated with a single intravenous injection of MSCs (1×10⁶ cell in PBS). Group 6 (Cis + MSCs + Br): Rats received Cis then treated with both MSCs and Br at the same manner and dosage as mentioned before.

The results of the present study revealed that Cis decreased the mean final body weight, CAT, SOD, GSH, Bcl2, EGF, VEGF and increased creat, UA, urea, BUN and MDA.

The histological studies showed that the Cis administration induced deleterious alterations in the renal tissue as Bowman's space enlargement, shrinkage of glomeruli with vascular congestion and brush border loss in the proximal tubular cells. Necrotic area was encountered in different regions in the tubular cells, karyolysis, karyorrhexis and inflammatory cell infiltration. Vacuolated cytoplasm and hyaline cast in the tubules.

The histochemical studies revealed that Cis decreased the total protein content in the tissue. On the other hand, the results of immune-histochemical studies showed that Cis increased the rate of inflammation and apoptosis while, the rate of the cell division and anti-inflammation decreased. Such results were detected by TNF-α, TUNEL, PCNA and IL-10 staining, respectively.

In contrast, the results showed that the Cis group treated with MSCs alone or in combination with Br resulted in an increase in body weight. The biochemical analysis showed significant improvement in creat, UA, urea, BUN, SOD, GSH, CAT, MDA, Bcl2, EGF and VEGF levels.

The histological and histochemical studies showed that treatment with MSCs or/and Br results in an improvement of the tissue of the kidney and total protein content as well as, the results of immune-histochemical