The Possible Protective Effect of Bee Propolis on Experimentally Mediated Cisplatin Reproductive Toxicity: A Histological and Immunohistochemical Study

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Background: Cisplatin (CIS) is one of the widely used anticancer drugs. In spite of its high efficiency in the treatment of testicular cancer, CIS has severe adverse effects on spermatogenesis and even may lead to infertility**.** Propolis is a honeybee product. It has free-radical scavenging activity**.**

Aim: To evaluate the possible protective effect of bee propolis on cisplatin – induced testicular damage in adult male albino rats by using histological, immunohistochemical and morphometric studies.

Materials & Methods: Twenty four adult male albino rats were divided into four groups, each group including six rats: control, propolis (100 mg/kg, orally daily for 7 days), CIS (10 mg/kg by a single IP injection and left for 5 days without treatment), combined therapy (propolis 7 days before CIS injection and continued for 5 days after). Testicular weights were measured. Histological (using H&E and Masson's trichrome stains) and immunohistochemical (using NF-kB/p65 and claudin 11) studies were performed. Morphometric measurement of seminiferous tubule (ST) diameter, area % of collagen fibers and claudin 11, in addition to optical density of NF-kB/p65 were done followed by statistical analysis.

Results: Testicular weight significantly decreased in CIS group. CIS caused distorted STs, cellular disorganisation, wide separation of intertubular space, cytoplasmic vacuolation, and pyknotic nuclei. Increased area% of collagen fibers, increased optical density of NF-kB/p65 immunoreactivity and decreased area% of claudin 11 immunoexpression were found in the spermatogenic cells. Combined therapy group showed a significant reduction in histological, immunohistochemical and morphometric changes.

Conclusions: A significant role of NF-kB activation was found in CIS-induced testicular damage. Blockade of NF-kB activation by propolis could be an effective strategy for protection from CIS-induced testicular damage, provided it is administered orally early enough before the administration of CIS. It also prevented the disruption of tight junction protein, claudin 11, thus, it could preserve blood-testis barrier (BTB) function.

Keywords: cisplatin, claudin 11, nuclear factor-κB, propolis, testicular damage.

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