

# **EFFECT OF BEE PROPOLIS ON EXPERIMENTALLY INDUCED CYCLOPHOSPHAMIDE HEMORRHAGIC CYSTITIS IN ADULT MALE ALBINO RATS: A HISTOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY**

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## **ABSTRACT**

**BACKGROUND:** Cyclophosphamide (CP) is an alkylating anticancer drug. It is used in the treatment of chronic and acute leukemia, multiple myeloma, and lymphomas. The urological adverse effects of CP are major limiting factors for its use. These urological complications include transient irritative voiding symptoms, hemorrhagic cystitis, bladder fibrosis, necrosis, contracture and vesicometral flux. Bee propolis is a honeybee product with a very complex chemical composition. It has an antioxidant property, antibacterial, antifungal, anti-inflammatory, immunomodulatory, antiviral and anticarcinogenic properties. The current study is designed to investigate the cellular mechanisms by which cyclophosphamide (CP) causes hemorrhagic cystitis, and evaluate the role of COX II in the pathogenesis of bladder damage induced by CP, then investigate the effects of propolis against CP-induced bladder injury in rats and its effect on cell regeneration by evaluating proliferatin cell nuclear antigen (PCNA) expression.

**AIM OF WORK:** The aim of the present study was to investigate the effect of bee propolis against CP- induced cystitis in adult male albino rats by using histological and immunohistochemical techniques.

**MATERIAL & METHODS:** This study was carried out on 50 male adult albino rats divided into five equal groups (ten rats each): Group I (normal control group), Group II (sham control group), Group III (propolis - treated group), Group IV (cyclophosphamide -treated group), Group V (cyclophosphamide and propolis - treated group). After the treatment, The histopathological (H & E and Mallory stain) and immunohistochemical (Anti COX II and PCNA excepretion) changes in urinary bladder were observed.

**RESULTS** Administration of CP (75mg/kg i.p.) in three doses induced cystitis, as manifested by marked congestion, oedema as well as a marked desquamative damage in the uroepithelium. There was marked increase in COX II expression and decrease in PCNA immunoreactive cells. Propolis administration to CP-treated rats significantly prevented these histopathologic & immunohistochemical changes.

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Key words: Propolis, Cyclophosphamide, Hemorrhagic cystitis, COX II, PCNA.

