Histological and Immunohistochemical Study on the Protective Effect of Melatonin on Gentamycin-Induced Renal Injury in Adult Male Albino Rats

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Background: Gentamycin is one of the widely used antibiotic drugs. In spite of its high efficiency in the treatment of gram-negative infection, gentamycin has severe adverse effects on kidney**.** Melatonin is the main pineal hormone. It has free-radical scavenging activity**.**

Aim: to study the histological and immunohistochemical changes that occur due to the effect of melatonin administration on gentamycin-induced renal injury in adult male albino rats.

Materials & Methods: Fifty adult male albino rats were divided into five groups. group 1: control, group 2: given melatonin (5mg/kg, orally daily for 2 weeks), group 3: gentamycin (40mg/kg, intramuscular injection daily for 2 weeks), group 4: gentamycin plus melatonin for 2 weeks and group 5: injected with gentamycin for two weeks, and then the drug was stopped for three weeks to check for spontaneous recovery. Histological (using H&E, Masson's trichrome stains and PAS reaction) and immunohistochemical (using COX II) studies were performed. Morphometric measurement of area % of collagen fibers, COX II in addition to optical density of PAS reaction were done followed by statistical analysis.

Results: Gentamycin only-treated group showed dilated Bowman's space, partial atrophic glomerulus, flattening of tubular lining epithelium, shed cells in tubules, cystic dilatation of tubules and inflammatory cells infiltration. Increased area% of collagen fibers, increased optical density of PAS reaction and increased area% of COXII immunoexpression were found. Melatonin-treated group reduced these histological changes.

Conclusions: A significant role of COX II activation in the pathogenesis of gentamycin-induced renal damage was proven. Blockade of its activation by an antioxidant such as melatonin could be an effective strategy for protection from gentamycin-induced renal damage provided adjusting the dose of melatonin

Keywords: melatonin, COXII, gentamycin, renal damage.

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