Effect of Urografin on the Kidney of Adult Female Albino Rat and the Possible Protective Role of Nebivolol: A Morphological and Ultrastructural Study

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ABSTRACT

Background: Contrast- induced nephropathy (CIN) means impairment of renal functions occurring within 48-72 hours following intravascular administration of contrast media with the absence of alternative cause.

Urografin is one of the most commonly used high-osmolar contrast agents. It induces its nephrotoxic effects via different mechanisms.

Nebivolol is a selective β_1-adrenergic receptor antagonist , used as a prophylactic agent for CIN for several reasons.

The present work was designed to study the histological and ultrastructural changes in the kidney of the adult female albino rat following intravenous administration of urografin and the possible protective role of nebivolol if used concomitantly with urografin.

Materials and Methods: Fifty adult female albino rats were used in this study. They were divided into five groups, ten rats each; group I (normal control), groupП(dehydrated sham) dehydrated for 3 days,

group Ш (dehydrated nebivolol treated) dehydrated for 3 days and received nebivolol by oral route at a daily dose of 2 mg/kg for 5 days, group IV(dehydrated contrast medium

administration) dehydrated for 3 days and injected urografin intravenously at a dose of 6 ml/kg at

day 4, groupV(dehydrated contrast medium and nebivolol administration) dehydrated for 3 days, received nebivolol by oral route at a dose of 2 mg/kg for consecutive 5 days and injected urografin intravenously at a dose of 6ml/kg at day4.Twenty four hours after the end of the experiment, all animals were sacrificed by cervical decapitation. Both kidneys were excised and prepared for either light microscopic or transmission electron microscopic studies.

Results: Administration of urografin to dehydrated rats resulted in severe nephrotoxic changes both in cortex and medulla.These findings were supported by ultrastructural study of glumeruli, proximal convoluted tubules and medullary thick ascending loop of Henle**.** Concomitant administration of nebivolol afford a partial protection to renal glomeruli and the renal tubules.

Conclusion: Urografin administration caused significant alterations in the renal histological structure.Concomitant administration of nebivolol affords a partial protection against urografin-induced nephrotoxicity due to its vasodilator and antioxidant effects. It can be recommended to use nebivolol to protect against urografin-induced nephropathy especially in patients who undergo coronary angiography .

Key words: Contrast-induced nephropathy, Urografin, Nebivolol, Kidney, Female rats.

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