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Effects of α-Lipoic Acid on Cisplatin-Induced Nephrotoxicity in Rats

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Background : Cisplaltin-induced polyuria is associated with a reduced expression of renal aquaporins (AQPs) and sodium transporters. The present study was aimed to examine whether a-lipoic acid (α-LA), an antioxidant, preserves renal AQPs and sodium transporters in cisplatin-induced nephrotoxicity.

Methods : Male Sprague-Dawley rats were treated with cisplatin (6 mg/kg, IP), in which one group was treated with α-LA (50 mg/kg, IP) along with cisplatin and the other was not. Four days later, the expression of AQPs and major sodium transporters was determined by western blot analysis and immunohistochemistry.

Results : Cisplatin increased urine output and fractional excretion of sodium. Accordingly, the expression of AQP1-3, Na, K-ATPase and NKCC2 was decreased, while NHE3 and NCC remained unchanged. α-LA treatment prevented the cisplatin-induced dysregulation of AQPs, Na, K-ATPase and NKCC2, along with improved urinary concentrating capability.

Conclusion : α-LA treatment may prevent the cisplatin-induced dysregulation of AQPs and sodium transporters.