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Effect of Vitamin E on Kidney Preservation Using Isolated Perfused Dog Kidney

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Abstract: Unsuccessful cadaveric kidney transplantation still remains as an important problem in organ transplantation. Cold storage solutions are not very efficient for kidney preservation. Vitamin E is an important dietary antioxidant, which may play a vital role in preventing free radical perfusion injury. We investigated the effect of vitamin E on kidney preservation with Euro-Collins (EC) solution using the isolated perfused dog kidney model. Recipients were randomly divided into 3 groups: group 1 (n = 6), immediately reperfused with EC solution, given laboratory pelleted diet and drinking water for 4 weeks; and group 2 (n = 6), flushed, and stored with EC solution at 4 °C for 48 h, given laboratory pelleted diet and drinking water for 4 weeks; group 3 (n = 6), flushed, and stored with EC solution at 4 °C for 48 h, and given laboratory pelleted diet containing 400 mg of vitamin E/kg for 4 weeks. In the isolated perfused dog kidney model, kidneys were perfused for 2 h at 37.5 °C, and the glomerular filtration rate (GFR), urinary flow rate (UFR), fractional reabsorption of sodium (FRNa+), perfusate flow rate (PFR), renal perfusion pressure (RPP), and released lactic dehydrogenase (LDH) in urine were measured. Our results showed that the functional parameters are very poor after prolonged cold ischemia. Levels of tubular injury marker were significantly higher with a longer ischemic period. In the group given vitamin E, renal functional parameters significantly increased and tubular injury marker in urine significantly decreased. These results indicated that vitamin E supplementation reduced ischemia reperfusion injury in the isolated perfused dog kidney model.

Key Words: Kidney transplantation, cold storage, organ preservation

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