

## Decreased Expression of Aquaporin Water Channels and Increased Nitric Oxide Synthesis in the Kidney in Rats with Glycerol Induced Acute Renal Failure

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**Background :** The present study was aimed to determine whether there exists an altered regulation of aquaporin (AQP) water channels and nitric oxide (NO) system in the kidney in glycerol induced acute renal failure (ARF).

**Methods :** Male Sprague-Dawley rats were deprived of fluid intake for 24 hours, and then were injected with 50% glycerol in normal saline (10 mL/kg, intramuscularly). At 24 hours after the glycerol injection, rats were killed by decapitation. Control rats were injected with normal saline. The protein expression of AQP1-3 in the kidneys was determined by Western blot analysis and immunohistochemistry. In addition, contents of nitric oxide metabolites (nitrite/nitrate, NOx) were measured in the plasma and urine by colorimetric assay.

**Results :** Serum concentrations of creatinine were significantly increased following the treatment of glycerol. The urinary flow rates, urine osmolality and free water reabsorption were significantly decreased. In the experimental group, the expression of AQP1-3 was significantly decreased in the kidney. Accordingly, immunolabeling of that was decreased. Plasma NOx contents were decreased, while urine NOx contents were increased.

**Conclusion :** Decreased expression of AQPs associated with increased NO synthesis in the kidney may play a role in the urinary concentration defect in glycerol induced ARF.