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Dendroaspis natriuretic peptide administered intracerebroventricularly increases renal water excretion

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Effects of intracerebroventricular (i.c.v.) infusion of *Dendroaspis* natriuretic peptide (DNP) on renal function were examined in anesthetized rats. The results were compared with those obtained by intravenous infusion of the same dose of DNP. The urine volume was increased four- to six-fold over basal values by i.c.v. infusion of DNP (6 pmol/min). The urine osmolality was decreased, while sodium excretion was not significantly altered. Intravenous infusion of the same dose of DNP had little effect on urinary water excretion. Neither arterial pressure nor heart rate was significantly changed by the infusion of DNP. Glomerular filtration rate measured by creatinine clearance remained unaltered. The diuretic response to i.c.v. DNP was markedly attenuated in rats which were deprived of their water supply for three days before the experiment. These results suggest that DNP can act within the central nervous system to increase the renal water excretion.

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Increased expression of aquaporin water channels in hypothyroid rat kidney

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The present study was aimed to determine the molecular mechanisms underlying the water retention associated with hypothyroidism. Male Sprague-Dawley rats (200~220 g) were experimentally induced of hypothyroidism by treatment with methimazole in drinking water (0.04%) for 8 weeks. In the experimental group, serum concentrations of thyroxine and triiodothyronine were significantly decreased. The expression of AQP2 was significantly increased in the cortex, outer medulla, and inner medulla of the kidney. The expression of AQP1 and AQP3 was significantly increased in the cortex, though not in the medulla. The adenylyl cyclase activity provoked by arginine vasopressin, sodium fluoride, or forskolin was blunted in the hypothyroid kidney, while plasma levels of arginine vasopressin were not significantly changed. The increased expression of AQP1-3 channels may in part be causally related with the water retention in hypothyroidism.