The Possible Effect of Desmopressin on Bladder Contractility

Introduction and Objective: Pediatric nocturnal enuresis and nocturnal polyuria is often treated with desmopressin. We doubt that decreasing urine amount is the only reason for nocturnal voiding improvements. Therefore a rat model of additional desmopressin was setup to evaluate local effects of desmopressin on bladder
Materials and Methods: Diurnal voiding patterns of rats were monitored with metabolic cages. Desmopressin were given in half of the rats to monitor voiding pattern, cystometrography, and urine/ serum biochemistry changes. Aquaporin 1, 2, and 3, along with Rho kinase and Transient receptor potential cation channel subfamily V member 4 (TRPV4) mRNA expression in bladder were evaluated for the effect of desmopressin on bladder. Urine nerve growth factor (NGF) was measured to correlate with bladder function
Results: Voiding interval was significant different between desmopressin treated rats and control. Detrusor contractility significantly increased after desmopressin treatment, which is demonstrated in cystometrography and bladder muscle strips contractility under electric field stimulation. The overall amount of bladder aquaporin 1, 2, and 3 generally increased in experiment group at the end of the study. There was no difference in Rho kinase mRNA expression and urine NGF between the two, but TRPV4 expression is increased in desmopressin rats.
Conclusions: Desmopressin may help increase bladder contractility and decrease voiding interval, and thus improve bladder voiding efficacy. It may work through increase of aquaporin or TRPV4 expression, but may not be associated with NGF or Rho kinase.