181

Lee F, Susser J, Mundy A, Foxall P, Craggs M
Institute of Urology and Nephrology, University College London

DOES URINARY SODIUM AFFECT BLADDER SENSATIONS IN PATIENTS WITH AN OVERACTIVE BLADDER DURING URODYNAMICS?

Aims of study

It has been postulated that urinary sodium may have an effect on bladder sensation mediated through mechano-sensitive epithelial sodium channels located in the bladder urothelium (1). Sensations during urodynamics can now be measured more objectively using a validated patient operated key-pad device (PUM – patient urge monitor) and it has been shown that during bladder filling in some patients with an overactive bladder (OAB), strong sensations of urge can occur at abnormally low bladder volumes (2). The aim of this study was to test the hypothesis that the concentration of urinary (infused) sodium within the physiological range can influence the sensations of urge in certain patients with an OAB during urodynamics.

Methods

With local ethics committee approval, 10 patients with OAB and 2 healthy volunteers were recruited for this study. Urodynamics (6 fills) were performed at one session each in all subjects using 20mM and 200mM sodium chloride (NaCl) filling solutions infused in a double-blinded random order. The sensation of urge during filling cystometry was detected using the validated PUM and these were graded from 0 to 4 (0=no urge, 1=slight, 2=moderate, 3=strong, 4=desperate). The patients were divided into two groups depending on their cystometric capacities (CC) being above or below 250ml. Urge scores were measured against infused volumes for both infusates in each subject and statistical analysis by a 2-tailed t-test was used to determine the significance of effect at the 95% confidence interval ($p<0.05$).

Results

All subjects satisfactorily completed 6 randomised filling cystometries with urge score measurements. In the patients with idiopathic detrusor overactivity (IDO) and a small (<250ml) CC (n = 4), there was a significant difference ($p=0.014$) in the volume infused (tolerated) at the corresponding urge scores between the 20mM and 200mM NaCl filling solutions. This difference was not significant for the 6 IDO patients with CC greater than 250ml ($p=0.10$) or the 2 healthy volunteers ($p=0.088$). These data are expressed graphically in Figure 1.

Conclusions

Higher concentrations of urinary sodium within the physiological range can influence the sensations of urge in patients with an OAB whose CC is small. In contrast, patients with IDO and healthy volunteers with normal or near normal CC are relatively ‘sodium resistant.’ These findings may suggest a differential diagnosis for some patients with a so-called ‘overactive bladder’ and point to a treatment that focuses more on managing the sensory problem rather than the muscular one in patients with a small bladder capacity. Future studies concerned with idiopathic bladder disorders should look at the metabolic factors affecting salt and water balance and consider the whole urinary tract, including its sensory function, as an integrated system.

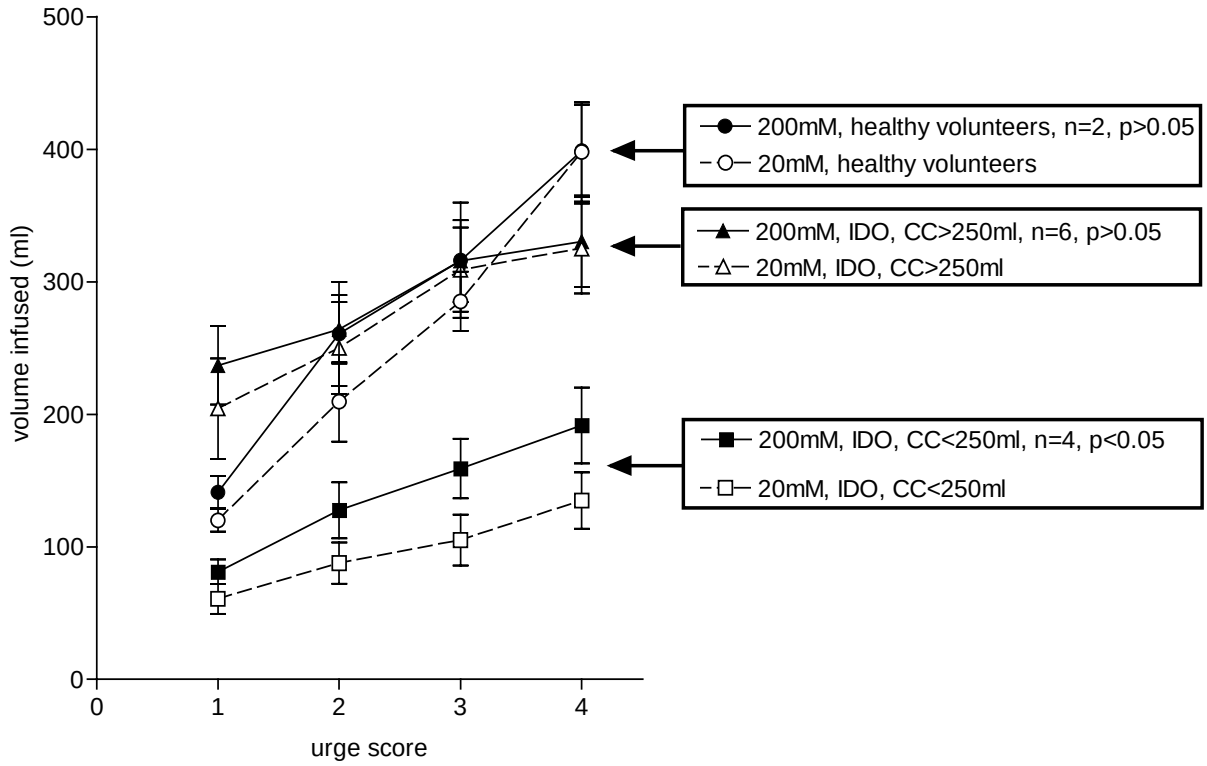

Figure 1. Volume infused during filling cystometry using 20mM and 200mM NaCl solution in the two groups of patients with IDO and healthy volunteers. The error bars denote the standard error of the mean.

1. Ferguson et al, J Urol 1997; 505: 503-511
2. Oliver et al, BJU International 2000; 86: 371-372.