

## REVISIT POTASSIUM CHLORIDE SENSITIVITY TEST – A SYSTEMATIC STUDY OF ITS ROLE ON LOWER URINARY TRACT DISEASES

### Hypothesis / aims of study

Although potassium chloride sensitivity test (PST) has been proposed as an indicator of urothelial dysfunction of lower urinary tract, its role on diagnosis of interstitial cystitis/bladder pain syndrome (IC/BPS) remains under debate. We systematically studied the results of PST in patients of various lower urinary tract diseases (LUTD).

### Study design, materials and methods

Urological patients with lower urinary tract symptoms and needing urodynamic study (UDS) were prospectively enrolled. The PST was routinely performed with infusion of 40 mL 0.4 M KCl solution after UDS. When there was urgency or pain sensation perceived by the patient after KCl instillation, a positive PST was judged. The prevalences of a positive PST in patients of different disease entities were analyzed. Clinical variables including gender, age, diagnoses, and UDS parameters were compared among patients with a positive or a negative PST result. Univariate and multivariate logistic regression analysis were implemented to find out the factors that predict a positive PST. The diagnosis of IC/BPS was made according to the National Institute of Diabetes and Digestive and Kidney Diseases criteria.

### Results

A total of 181 consecutive patients (65 male and 116 female) aged 61.2±14.5 were enrolled. The patients were subdivided into 7 categories of diseases and the prevalences of pain or urgency sensation induced by intravesical instillation of KCl were shown in Table 1. Finally 49 of the 50 IC/BPS subjects and 26 of the 131 non-IC/BPS patients were shown to have a positive PST, making the sensitivity and specificity of PST on diagnosis of IC/BPS to be 98% and 80% respectively (Table 2). When compared with patients with a negative PST, those with a positive PST were more likely to be female, to be younger, to have IC/BPS, and to have lower volumes at cystometry bladder capacity and postvoid residual urine (PVR) (all p<0.05). Multivariate logistic regression analysis revealed that a female gender and the disease IC/BPS predicted a positive PST in patients with LUTD.

### Interpretation of results

A positive PST could be observed in patients with LUTD other than IC/BPS with a prevalence rate ranged from 0% to 44%. Various degree of urothelial dysfunction might be involved in these subjects although the pathogeneses of each disease were different. Nevertheless, almost all the IC/BPS patients had a positive PST suggesting the significant role of PST/ urothelial dysfunction on IC/BPS.

### Concluding message

This prospective systematic study demonstrated the significant role of PST on the differentiation of IC/BPS from other lower urinary tract diseases. However, LUTD patients with a female gender might have a greater chance to have a positive PST.

Table 1. The prevalence of positive potassium sensitive test in patients with different lower urinary tract diseases.

Diagnosis	PST-Pain (%)	PST-Urge (%)	Negative PST (%)	Total
BOO	1 (4)	1 (4)	24 (92)	26
DO	6 (18)	2 (6)	26 (76)	34
HSB	6 (33)	2 (11)	10 (56)	18
IC/BPS	46 (92)	3 (6)	1 (2)	50
NVD	0 (0)	0 (0)	3 (100)	3
SUI	5 (19)	0 (0)	22 (81)	27
VD	1 (4)	2 (9)	20 (87)	23
TOTAL	65 (36)	10 (6)	106 (58)	181

p=0.000, Fisher's exact test. BOO: bladder outlet obstruction, DO: detrusor overactivity, HSB: hypersensitivity bladder, IC/BPS: interstitial cystitis/bladder pain syndrome, NVD: neurogenic voiding dysfunction, PST: potassium sensitive test, SUI: stress urinary incontinence, VD: other voiding dysfunction.

Table 2. The prevalence of positive potassium sensitive test in patients with IC/PBS or non-IC/PBS among the 181 patients with lower urinary tract diseases.

Diagnosis	Positive PST (%)	Negative PST (%)	Total
IC/BPS	49 (98)	1 (2)	50
Non-IC/BPS	26 (20)	105 (80)	131
Total	75 (41)	106 (59)	181

p=0.000, Fisher's exact test.

Table 3. Factors that predict a positive potassium sensitive test in patients with various lower urinary tract diseases

Parameters	Univariate		Multivariate	
	OR (95% CI)	p Value	OR (95% CI)	p Value
Gender (F)	9.742 (4.263-22.267)	0.000	10.183 (3.007-34.477)	0.000
Age	0.936 (0.912-0.961)	0.000	0.996 (0.961-1.033)	0.848
Disease (IC)	197.885 (26.097-1500.516)	0.000	163.147 (17.335-1535.427)	0.000
FSF	0.999 (0.994-1.003)	0.504	-	-
FD	0.997 (0.994-1.001)	0.119	-	-
CBC	0.996 (0.994-0.999)	0.002	0.998 (0.994-1.001)	0.220
Compliance	1.003 (0.999-1.008)	0.175	-	-
Pdet	0.983 (0.965-1.002)	0.077	-	-
Qmax	1.002 (0.963-1.043)	0.912	-	-
Vol	0.999 (0.997-1.001)	0.304	-	-
PVR	0.998 (0.995-1.000)	0.050	0.997 (0.993-1.001)	0.141

FSF: first sensation of filling, FD: first desire to void, CBC: cystometry bladder capacity, Pdet: detrusor pressure at Qmax, Qmax: maximum flow rate, Vol: voided volume, PVR: postvoid residual urine.

Disclosures

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