

## CORRELATION BETWEEN BLADDER UROTHELIAL THICKNESS AND CLINICAL SYMPTOMS IN PATIENTS WITH INTERSTITIAL CYSTITIS / BLADDER PAIN SYNDROME (IC/BPS)

### Hypothesis / aims of study

Interstitial Cystitis / Bladder Pain Syndrome (IC/BPS) is a chronic bladder condition characterized by bladder pain, urinary urgency, urinary frequency, and nocturia. Recent studies showed that increased apoptosis and denudation/thinning of the bladder urothelium are common findings in IC/BPS patients. Thus, the aim of our study is to investigate the relationship between urothelial thickness and clinical symptoms of IC/BPS patients

### Study design, materials and methods

The study group consisted of 30 patients with IC/BPS and the control group consisted of 12 volunteers without any IC/BPS symptoms. Bladder biopsies were taken from both groups. We determined the thickness of the bladder urothelium by immunohistochemical staining for CK7 (cytokeratin 7; an epithelial marker). There are six clinical symptoms in consist of symptom questionnaire and potassium chloride sensitivity test (KCL test). The five symptom questionnaire including visual pain analogue scale (VAS-pain scale), visual urgency analogue scale (VAS-urgency scale), O'Leary-Sant Symptom Index (ICSI), O'Leary-Sant Problem Index (ICPI), and Pain and Urgency / Frequency symptom scale (PUF scale) were also recorded. The pain score of KCL Test was also performed. We analyzed the correlation between bladder urothelial thickness and clinical symptoms by using Spearman's rho.

### Results

The demographics of IC/BPS patients were listed in Table 1. The thickness of bladder urothelium was significantly decreased in the IC/BPS group as compared with that in the control group, as revealed by the CK7 stain measurement (about 26  $\mu\text{m}$  vs. 50  $\mu\text{m}$ ) (Figure 1 (A) & (B)). We divided IC/BPS group into two groups, thinner group and thicker group, by using urothelial thickness. There is negative correlation between urothelial thickness and VAS-urgency scale & PUF scale in thinner group. Moreover, the thinner urothelial thickness is statistically association with the increased pain score of KCL test in thicker group.

### Interpretation of results

IC/BPS group have more decreased bladder urothelial thickness than control group. Moreover, the thinner group showed correlation between bladder urothelial thickness and urgent sensation. The thicker group revealed correlation between thickness and pain.

### Concluding message

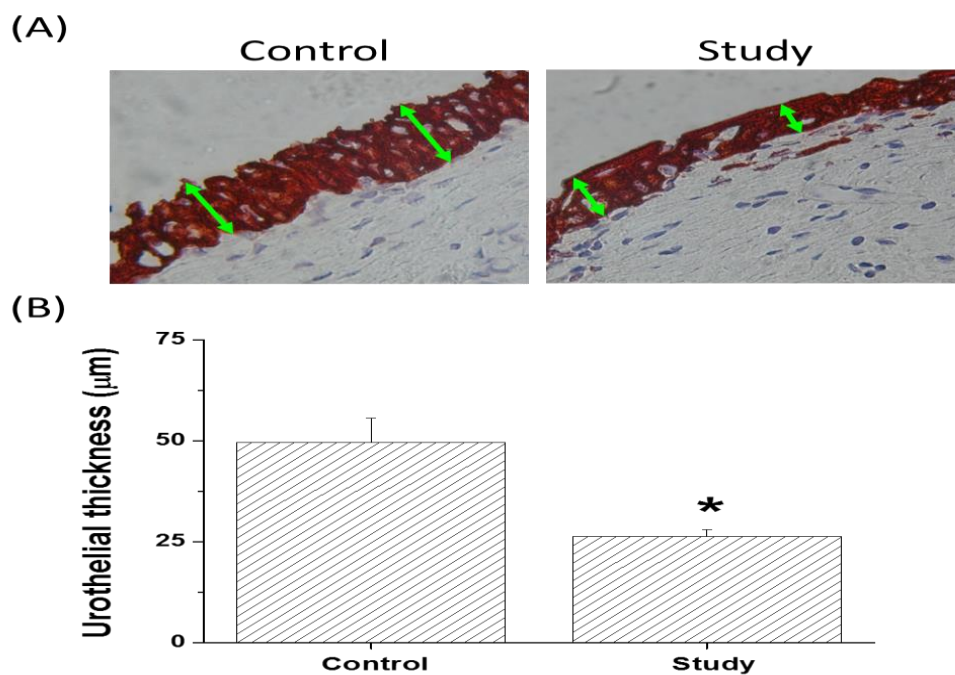
The bladder urothelial thickness was significantly decreased (approximately 50% less) in the IC/BPS group compared with that in the control group. In patients with IC/PBS, urothelial thickness was correlated significantly with the different score groups in both thicker and thinner urothelial thickness groups.

**Table 1** > Demographics of IC/BPS patients

Items (unit or range)	N	Value (mean $\pm$ standard error)
Age (years)	30	40.5 $\pm$ 1.77
No. 24-h frequency	21	14.66 $\pm$ 2.24
No. nocturnal frequency	21	3.30 $\pm$ 0.99
Mean symptomatic duration (years)	22	6.91 $\pm$ 3.38
Maximum bladder capacity (mL)	21	275.71 $\pm$ 25.48
Glomerulation <sup>†</sup>		Mild: 1, Moderate: 3, Severe: 26
Comorbidity		Negative
Urine cytology		Negative
Visual pain analogue scale (0-10)	21	4.81 $\pm$ 0.79
Visual urgency analogue scale (0-10)	21	6.71 $\pm$ 0.57
O'Leary-Sant Symptom Index (0-20)	20	12.25 $\pm$ 0.55
O'Leary-Sant Problem Index (0-16)	20	9.90 $\pm$ 0.77
Pain and Urgency/Frequency symptom scale (0-35)	20	18.65 $\pm$ 1.78
Pain score of KCl test (0-5)	21	3.05 $\pm$ 0.32

<sup>†</sup>Definition of severity of glomerulation: mild, smaller than 2 quadrants of localized glomerulation; moderate, diffuse smaller than 2 quadrants of localized glomerulation; severe, splotches and waterfall bleeding.

<Figure 1> The bladder urothelium in IC/BPS and control group



Disclosures

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