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CORRELATION WITH URINARY EPITHELIUM AND PRIMARY SYMPTOMS IN INTERSTITIAL CYSTITIS: INVESTIGATION OF SCANNING ELECTRON MICROSCOPY

Hypothesis / aims of study
Interstitial cystitis (IC) remains a poorly understood urological condition. However, it is suggested that the pathophysiology of IC involves disruption of the urothelial barrier, leading to symptoms and disease. We investigated associations between bladder epithelium and urinary symptoms for patients with interstitial cystitis by using scanning electron microscopy (SEM).

Study design, materials and methods
Bladder tissue biopsies was obtained during routine diagnostic evaluation from macroscopic normal posterior wall of 13 patients with IC (9 females and 4 males with a ranged of 19 to 80 year-old) from November 2008 to January 2011, and examined by HE staining, astra blue staining for mast cell, and SEM. Three pathology features were noted (1) mast cell counts in lamina propria on astra blue stain (2) loss of urothelium on H.E. stain and SEM (3) inflammation in lamina propria on H.E stain. Symptoms were evaluated before treatment by IPSS, QOL index, and O'Leary and Sant score.

Results
Hunner's ulcer was observed in only one patient by macroscopic findings of this study. The mean IPSS score was 21.0 with a ranged of 7 to 32. The mean QOL score was 5.4 with a ranged of 3 to 6. The mean O'Leary and Sant score was 12.8 with a ranged of 5 to 20 (symptom index), and 10.0 with a ranged of 4 to 16 (problem index). The number of mast cell >30 cells/mm^2 was 6 of 13 patients. Four patients had severe to moderate inflammation findings in H.E. staining. There is no correlation between the number of mast cell, degree of inflammation and each symptom score. More than 50 % of loss of urothelium was observed in 4 patients by SEM and H.E. The denude of urothelium ranged of 10 to100% was seen in 13 patients by H.E. staining. The findings of urothelium by SEM and H.E. were almost similar (Figure 1). The O'Leary and Sant score in both symptom and problem index was significantly correlated with degree of loss of urothelium between more than 50 % group and less than 50% group (p=0.0106 and p=0.0194, respectively).
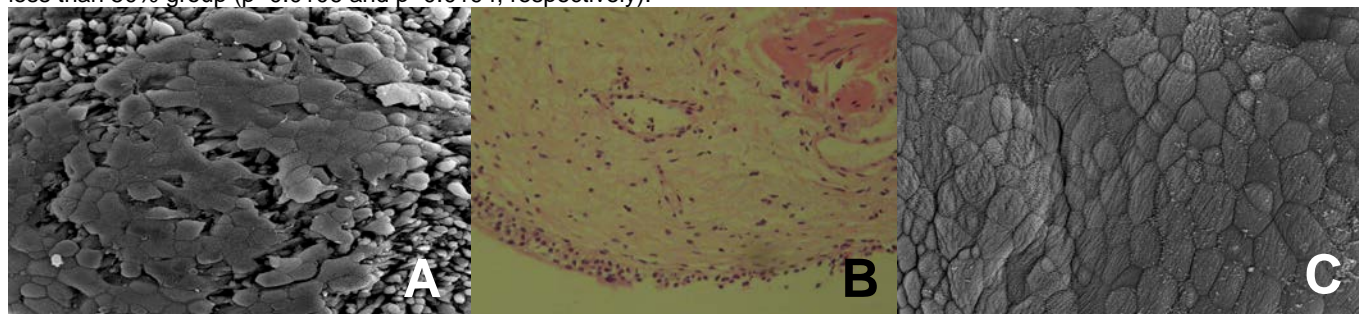

Figure 1: (A) Scanning electron microscopic finding showed partial denude of urothelium in IC patient. (×350) (B) H.E. staining also showed the damage of urothelium in the same patient. (×20). (C) Scanning electron microscopic finding of normal bladder urothelium

Interpretation of results
In patients with IC, histological findings were various. The disruption of outer layer of urothelium was clearly observed in all patients by SEM even in macroscopic normal finding area. Moreover the degree of urothelial disruption and symptom were correlated not with the degree of inflammation.

Concluding message
The urothelium may play a pivotal role of IC symptoms. We should investigate new therapy targeting for urothelium protection.

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Was this study approved by an ethics committee?	**Yes**
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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**