

MAST CELLS INFILTRATION IS INCREASED IN THE BLADDER TISSUE OF PATIENTS WITH OVERACTIVE BLADDER SYMPTOMS AND INTERSTITIAL CYSTITIS/PAINFUL BLADDER SYNDROME

Hypothesis / aims of study

Recent investigations have linked overactive bladder syndrome (OAB) with chronic inflammation. Urinary nerve growth factor and cytokines and serum C-reactive protein have been demonstrated to increase in patients with OAB and interstitial cystitis (IC/PBS). Previous studies have revealed that mast cells are multifunctional effectors of the immune system, and have been reported to play an important role in the pathophysiology of IC/PBS. Because there are similarities in the inflammatory protein expression between OAB and IC/PBS, we hypothesized that inflammatory reactions might also exist in the bladder tissue of OAB. This study was designed to measure the infiltration of mast cells in the bladder tissue of patients with OAB and IC/PBS.

Study design, materials and methods

The study was performed in 23 patients with OAB, 13 patients with IC/PBS, and 12 patients with stress urinary incontinence but without urgency frequency symptoms and served as controls. Distribution of mast cells in bladder wall biopsies from these patients were evaluated quantitatively using immunofluorescence staining. The percentages of tryptase-positive mast cells were calculated from 5 consecutive high-power fields (X400) in the area with the highest dense infiltrate. Two to three sections per sample from OAB or IC/PBS bladders and controls were examined. Statistical analysis was performed using Mann-Whitney test and p value small than 0.05 was considered as significance. This study was approved by the Institution Review Board of the Tzu Chi General Hospital.

Results

The OAB group consisted of 15 women and 8 men aged from 49 to 80 years old (mean 65). Patients with IC/PBS were 13 women aged 31 to 53 years old (mean 41). Control patients were 12 women aged 38 to 69 years old (mean 55). All OAB patients presented with urgency and urgency incontinence (OAB wet) and the bladder tissue were obtained during procedure of intravesical botulinum toxin injection. All patients with IC/PBS had been proven by cystoscopic hydrodistention and had characteristic glomerulation. The bladder tissues of the controls were obtained during anti-incontinence surgery. The number of mast cells in suburothelium and detrusor area was low in the control group (mean \pm standard error 2.08 ± 0.57 , median 1.00). However, a highly significant increase of the mast cells infiltration was observed in the specimens from OAB (7.57 ± 1.04 , median 7.00) and IC/PBS patients (8.70 ± 2.12 , median 5.00) ($p < 0.000$ and $p = 0.001$, respectively). (Figure1, 2)

Interpretation of results

In our study, patients with OAB and IC/PBS all had significantly greater number of mast cells in the bladder wall compared with controls. The bladder biopsies from IC/PBS patients reported previously have confirmed the involvement and presence of mast cells in the detrusor. Mast cells have been considered as crucial effector cells for the immune response implicated in the pathogenesis of IC/PBS. Bladder mast cell activation has been reported as a characteristic pathological finding in a subset of IC/PBS patients. Measurement of surrogate mast cell-related products in urine has been previously studied to assess the disease extent in patients. Since patients with OAB and IC/PBS all had elevated mast cell activities compared with that of the controls in this study, It is possible that a common pathway of chronic inflammation exists in the pathogenesis between these two diseases.

Concluding message

The results of this study suggest that both IC/PBS and OAB are associated with chronic inflammation and the role of bladder tissue mast cells in the pathogenesis and pathophysiology of OAB and IC/PBS is worthy of further investigation.

Figure1. Scatter plot of mast cell number in OAB, IC/PBS, and control bladder

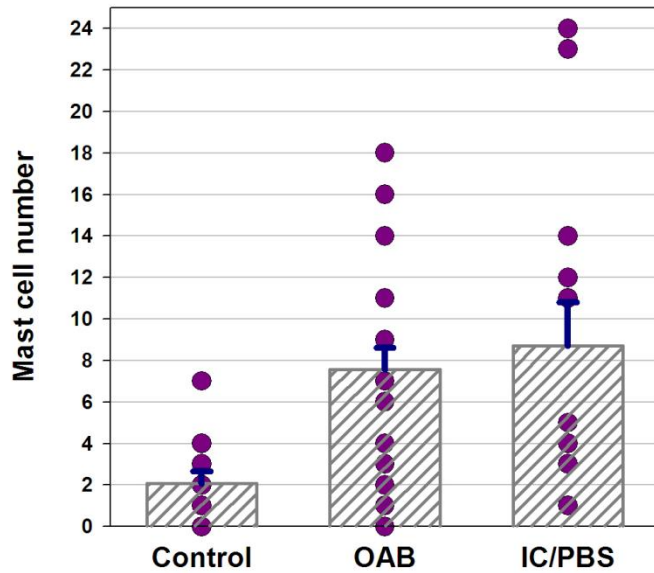
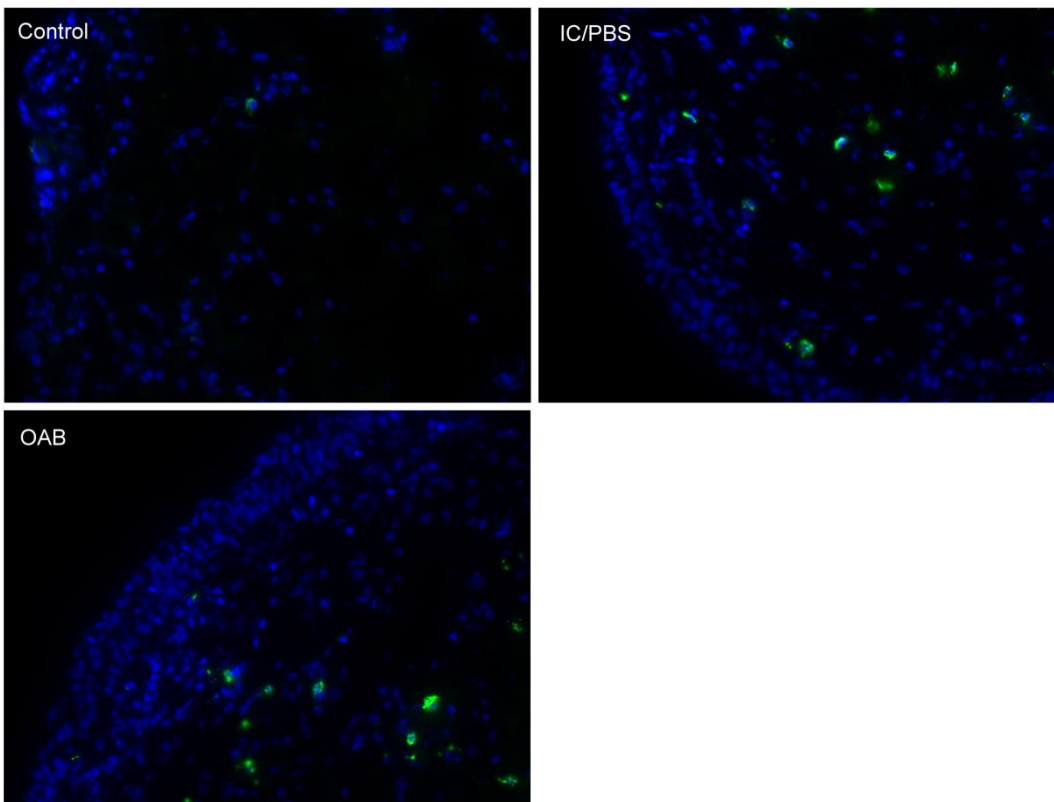


Figure2. Immunofluorescence staining of mast cell activity in OAB, IC/PBS, and control bladder



<i>Specify source of funding or grant</i>	The results of this study suggest that both IC/PBS and OAB are associated with chronic inflammation and the role of bladder tissue mast cells in the pathogenesis and pathophysiology of OAB is worthy of further investigation.
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Institution Review Board of the Tzu Chi General Hospita
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes

