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INCREASED PRO-INFLAMMATORY CYTOKINE AND CHEMOKINE EXPRESSIONS IN SERUM OF PATIENTS WITH INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME

Hypothesis / aims of study

Interstitial cystitis/bladder pain syndrome (IC/BPS) is a syndrome of chronic bladder and pelvic pain with symptoms of urgency and frequency. The etiology and pathogenesis are still unclear. Several possible pathophysiologic mechanisms including epithelial dysfunction, mast cell activation, autoimmune, neurogenic and chronic inflammation have been proposed. In our recently study, an elevation of serum C-reactive protein (CRP) in patients IC/BPS has been reported. The results imple that chronic inflammation is present in the urinary bladder of IC/BPS patients. This study measured the pro-inflammatory cytokines (IL-1β, IL-6, TNF-α)and chemokine (IL-8) expressions in serum of patients with IC/BPS, which may elucidate the association between these inflammatory mediators and clinical characteristcs of IC/BPS.

Study design, materials and methods

Serum samples were collected from 30 IC/BPS patients and 26 control subjects. The concentrations of serum IL-1β, IL-6, TNF-α and IL-8 were quantified using a bead-based human serum adipokine panel kit (Millipore, Billerica, MA, USA) according to the manufacturer's instructions. Differences in serum IL-1β, IL-6, TNF-α and IL-8 levels between the IC/BPS patients and the controls were compared by the non-parametric Mann-Whitney U test. Furthermore, Pearson's correlation coefficients were used to ascertain correlations between CRP, pro-inflammatory cytokines and cytokines. A *p*-value of < 0.05 was considered statistically significant.

Results

The results from the serum adipokine assay showed that pro-inflammatory cytokines (IL-1β, IL-6, TNF-α) and chemokine (IL-8) levels were significantly higher in the patients with IC/BPS than the controls (all $p < 0.001$) (Table1, Fig.1). Although the IC/BPS patients were older than the control subjects, neither serum IL-1β, IL-6, TNF-α nor IL-8 was correlated with age in all subjects. Analyzing the corelation between expressions of pro-inflammatory cytokines, IL-8 and CRP in IC/BPS serum samples, a significant correlation was found between IL-1β and IL-8 (Fig. 2A); IL-6 and CRP (Fig. 2B); IL-6 and IL-8; IL-6 and TNF-α. The *p* values were <0.001, 0.01, 0.02 and 0.03, respectively.

Interpretation of results

Cytokines and chemokines play crucial roles in the pathogenesis of several chronic inflammatory diseases. The up-regulated profile of serum IL-1β, IL-6, TNF-α and IL-8 levels in IC/BPS patients might potentially have a prognostic role and/or serve as a tool in choosing a proper therapeutic agent for the treatment. A large sample size and more extensive prospective longitudinal studies in the future are required to confirm this finding.

Concluding message

Increased pro-inflammatory cytokines (IL-1β, IL-6, TNF-α) and chemokine (IL-8) expressions in serum of IC/BPS implies not only mast cell activation, but also some other inflammatory mediators may play important roles in the pathogenesis of IC/BPS. Our previous report and these results suggest IC/BPS is a chronic inflammation disease.

Table 1. Expression of serum IL1β, IL6, TNF-α and IL8 in IC/PBS patients and controls

	Controls (*n* = 26)	IC/PBS (*n*= 30)	*P value*
Gender	F:16 M:10	F: 26 M: 4	
Age	32.4 ± 1.56 (22~55)	50.6 ± 2.68 (24~86)	<0.0001
IL-1*β*(pg/ml)	1.64 ± 0.47 (0.00~6.08)	6.45 ± 0.71 (2.77~23.96)	<0.0001
IL-6 (pg/ml)	0.79 ± 0.21 (0.00~3.67)	1.52 ± 0.24 (0.00~6.14)	<0.0001
TNF-α(pg/ml)	0.91 ± 0.17 (0.00~4.64)	2.63 ± 0.60 (0.62~13.70)	<0.0001
IL-8(pg/ml)	1.45 ± 0.21 (0.00~4.09)	3.23 ± 0.48 (0.00~15.08)	<0.0001

Mean ± standard error (Min ~ Max)

Fig. 1. Scatter plot of serum IL-1β, IL-6, TNF-α and IL-8 in IC/BPS patients and controls.

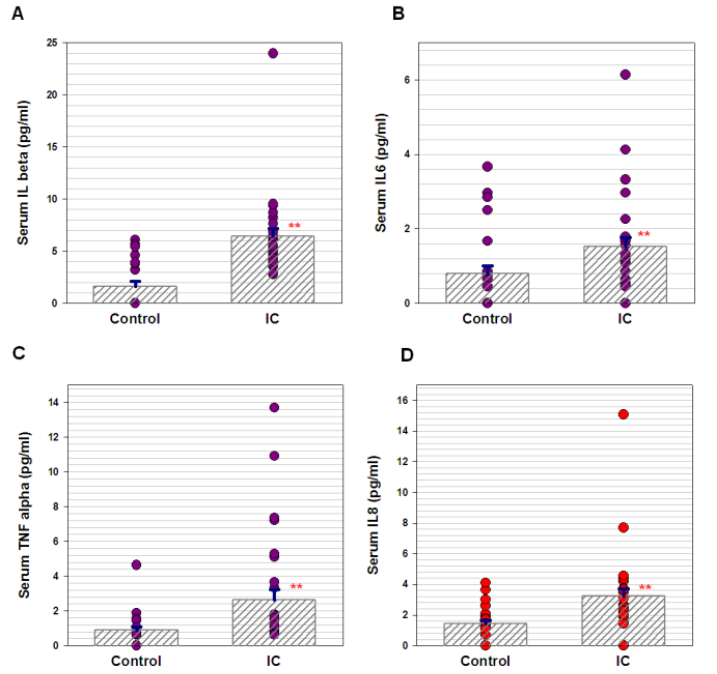

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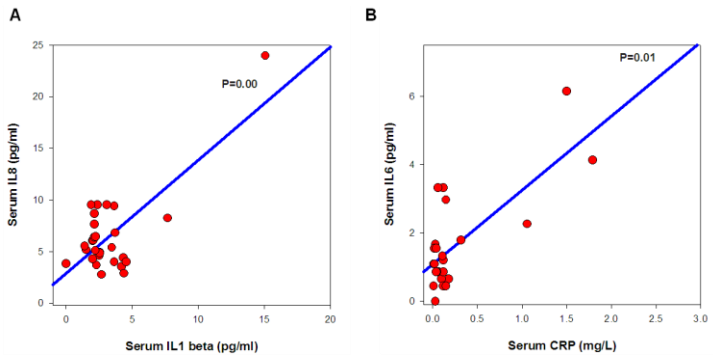
Fig. 2. Association of IL-1β and IL-8; IL-6 and CRP levels in serum of IC/BPS patients.



Disclosures
Funding: None **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Buddhist Tzu Chi General Research Ethics Committee **Helsinki:** Yes **Informed Consent:** Yes