

## SIGNIFICANCE OF C-REACTIVE PROTEIN AN INFLAMMATORY MARKER IN INTERSTITIAL CYSTITIS

### Hypothesis / aims of study

In the diagnosis of interstitial cystitis (IC), both the gross findings on cystoscopy and the histopathological findings on bladder biopsy play very important roles. In particular, the differentiation of non-Hunner type (N-type) and Hunner type (H-type) lesions is critical because the result sometimes affects patient prognosis. If the H-type, which is thought to be a more severe IC, is treated appropriately with electrical ablation, the treatment outcome with bladder hydrodistension alone would be insufficient. Although gross diagnosis has obvious limitations the use of simple and useful preoperative biomarkers to differentiate these different lesions has not been fully investigated.

Recently, reports have indicated the usefulness of inflammatory markers associated with disease severity and patient prognosis in the management of chronic inflammation diseases and malignant tumors. Thus, we investigated C-reactive protein (CRP) as an inflammatory marker for differentiation of N-type and H-type in IC patients.

### Study design, materials and methods

This study included patients who were diagnosed with IC at our hospital between April 2007 and September 2016. They were divided into an N-type group and an H-type group according to the gross findings on intraoperative cystoscopy. Serum CRP levels were measured preoperatively were used to compare the 2 groups.

In addition, the relationships between the presence of Hunner lesions and the Interstitial Cystitis Symptoms Index (ICSI), the Interstitial Cystitis Problem Index (ICPI), and serum CRP were evaluated.

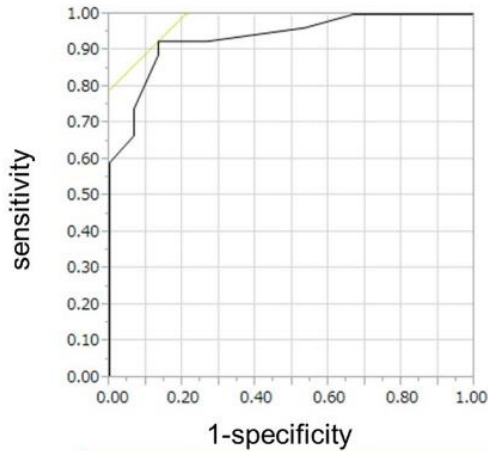
### Results

Of 42 patients (13 men), with a mean age of  $62.7 \pm 10.7$  years, the N group and H group comprised 15 (5 men) and 27 (8 men), respectively. The CRP levels were  $0.04 \pm 0.03$  mg/dL in the N group and  $0.16 \pm 0.12$  mg/dL in the H group; the difference was significant ( $P < 0.001$ ). The ICSI-total score was  $14.1 \pm 3.8$  in the H group, which was significantly higher than the  $8.3 \pm 3.6$  in the N group ( $P < 0.001$ ). The ICPI-total score was  $12.4 \pm 3.3$  in the H group, which was also significantly higher than the  $6.7 \pm 3.1$  in the N group ( $P < 0.001$ ). Additionally, both the ICSI-total score and ICPI-total score were positively correlated with the CRP levels (ICSI-total score,  $r = 0.455$ ,  $P = 0.003$ ; ICPI-total score,  $r = 0.492$ ,  $P < 0.001$ ). Evaluation of the presence of Hunner lesions and the CRP levels with a receiver operating characteristic curve (ROC) showed an area under the curve (AUC) of 0.936. When the cut-off value for CRP was defined as 0.07mg/dL, the sensitivity and specificity were 92.6% and 86.7%, respectively, for the diagnosis of Hunner lesions.

	Patients' characteristics			
	Entire	N group	H group	P value
Gender Male / Female	42 (13/29)	15 (5/10)	27 (8/19)	-
Age (years)	$62.7 \pm 10.7$	$64.6 \pm 6.8$	$61.6 \pm 12.4$	0.286
Serum CRP (mg/dl)	$0.12 \pm 0.11$	$0.04 \pm 0.03$	$0.16 \pm 0.12$	< 0.001
*ICSI				
Q1 urgency	$2.5 \pm 1.5$	$1.8 \pm 1.4$	$2.8 \pm 1.4$	0.030
Q2 frequency	$3.3 \pm 1.3$	$2.2 \pm 0.9$	$3.9 \pm 1.1$	< 0.001
Q3 nocturia	$3.4 \pm 1.3$	$2.5 \pm 1.1$	$4.0 \pm 1.0$	< 0.001
Q4 pain	$2.9 \pm 1.6$	$1.8 \pm 1.3$	$3.5 \pm 1.5$	0.013
Total score	$12.0 \pm 4.7$	$8.3 \pm 3.6$	$14.1 \pm 3.8$	< 0.001
**ICPI				
Q1 daytime frequency	$2.3 \pm 1.3$	$1.2 \pm 1.0$	$2.9 \pm 1.1$	0.001
Q2 nocturia	$2.8 \pm 1.1$	$2.1 \pm 0.9$	$3.3 \pm 1.0$	< 0.001
Q3 urgency	$2.6 \pm 1.2$	$1.9 \pm 1.0$	$3.1 \pm 1.1$	0.002
Q4 pain	$2.6 \pm 1.4$	$1.6 \pm 1.3$	$3.2 \pm 1.0$	< 0.001
Total score	$10.4 \pm 4.2$	$6.7 \pm 3.1$	$12.4 \pm 3.3$	< 0.001

\* Interstitial Cystitis Symptoms Index, \*\* Interstitial Cystitis Problem Index

### Receiver Operation Characteristic curve for the diagnosis of Hunner type



Area under the curve=0.936  
Cutoff value of CRP= 0.07 mg/dl  
Sensitivity=92.6%  
Specificity=86.7%

#### Interpretation of results

Given the high level in IC patients with Hunner lesions, CRP may be a useful preoperative marker for their presence. In addition, CRP may also be associated with disease severity, and thus can be used to determine the therapeutic effect.

#### Concluding message

The preoperative serum CRP level, when combined with gross findings on intraoperative cystoscopy, may be a simple and useful predictive marker of Hunner lesions in patients with suspected IC.

#### Disclosures

**Funding:** None **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Nagasaki University Hospital **Helsinki:** Yes **Informed Consent:** Yes