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COMPARISON OF INFLAMMATORY URINE MARKERS IN PATIENTS WITH INTERSTITIAL CYSTITIS AND OVERACTIVE BLADDER

Hypothesis / aims of study

Overlapping symptoms of interstitial cystitis (IC) and overactive bladder (OAB) often complicate the diagnosis and suitable treatments. In addition, the chronic inflammatory condition seems to be a shared characteristic in patients with IC and OAB. Thus, we measured forty inflammatory urine markers in IC patients with or without Hunner lesions (HIC and NHIC, respectively) and OAB patients.

Study design, materials and methods

Urine was collected from 30 HIC consecutive patients, 30 NHIC patients and 28 age and gender-matched OAB patients with no history of IC, recurrent urinary tract infection or bladder cancer. The diagnosis of IC was based on the Asian IC guideline criteria. Representative forty inflammatory growth factors, cytokines and chemokines in urine were measured by a MILLIPLEX immunoassay kit. Statistical differences in these markers among the groups were determined by non-parametric ANOVA followed by multiple comparison test. The diagnostic efficiency of these markers was measured using receiver operating characteristic analysis.

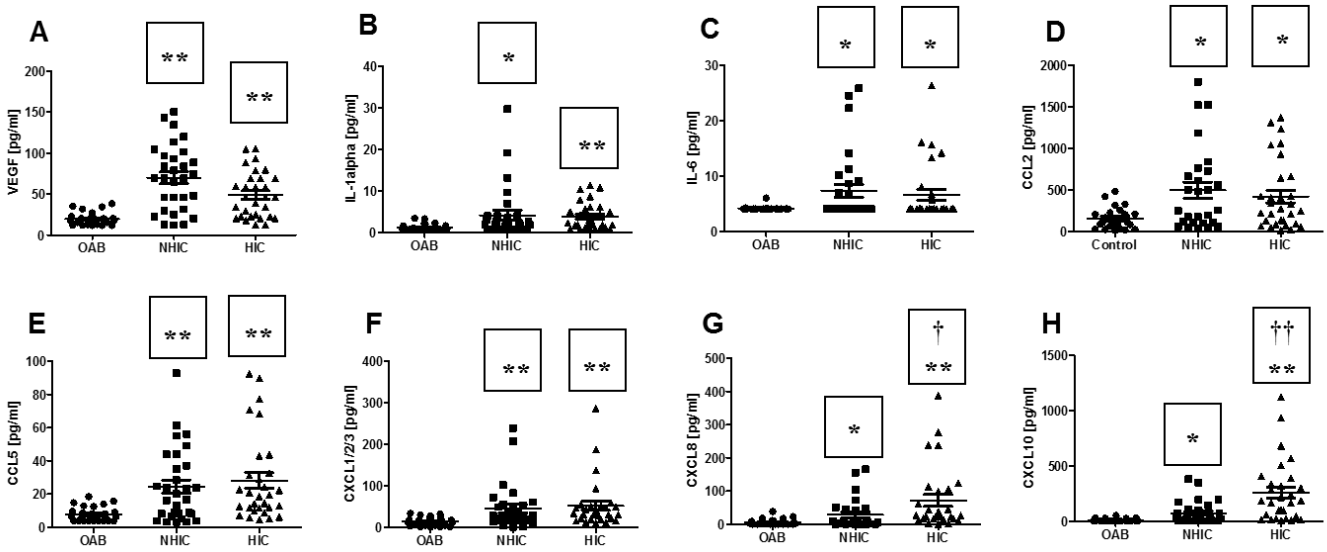

Fig. 1 Scatter plots of urine VEGF-A (A), IL-1α (B), IL-6 (C), CCL2 (D), CCL5 (E), CXCL1/2/3 (F), CXCL8 (G) and CXCL10 (H) levels.
*: p<0.05, **: p<0.01 vs controls, †: p<0.05, ††: p<0.01 vs NHIC

Table 1 Receiver operating characteristic analysis for inflammatory urine markers.

	AUC	Cutoff value [pg/ml]	Sensitivity [%]	Specificity [%]
VEGF	0.87	23.8	76.7	82.1
CXCL10 (IP10)	0.86	9.6	83.1	78.6
CXCL8 (IL-8)	0.81	11.2	67.9	81.5
IL-1α	0.80	1.7	68.3	77.8
CCL5 (RANTES)	0.80	9.8	70.0	77.8
CCL2 (MCP-1)	0.71	—	—	—
IL-6	0.66	—	—	—
CXCL1/2/3 (GRO)	0.50	—	—	—

Results

Vascular endothelial growth factor (VEGF), interleukin-1α (IL-1α), IL-6 and chemokines including CCL2, CCL5, CXCL1/2/3, CXCL8 and CXCL10 were significantly increased in HIC and NHIC patients compared with OAB patients. The significant increases in CXCL8 and CXCL10 were also found in HIC patients compared with NHIC patients (Fig. 1). However, there were no significant differences in the other urine markers among the groups. Area under the curves (AUCs) for VEGF, CXCL10, CXCL8, IL-1α, CCL5, CCL2, IL-6 and CXCL1/2/3 to detect IC in these patients were 0.87, 0.86, 0.81, 0.80, 0.80, 0.71, 0.66 and 0.50, respectively (Table 1).

Interpretation of results

VEGF plays a key stimulatory role in angiogenesis whereas CXCL10 is a potent inhibitor of angiogenesis (Ref. 1). CXCL10 can induce not only anti-angiogenesis effects, but also pro-inflammatory response by activating T lymphocytes. CCL2 or CCL5 causes chemotactic migration of monocytes, eosinophils, basophils, lymphocytes or mast cells but not does not act on neutrophils (Ref. 2) whereas CXCL1/2/3 and CXCL8 are mainly chemotactic for neutrophils (Ref. 3). In addition, both IL-1, including IL-1α and IL-1β, and IL-6 have many pro-inflammatory effects.

Concluding message

IC patients seems to have more severe chronic bladder inflammation evidenced by the significant increases in IL-1α, IL-6, CCL2, CCL5, CXCL1/2/3, CXCL8 and CXCL10 compared with OAB patients. In addition, the increases in angiogenesis-associated proteins such as VEGF and CXCL10 may pathophysiologically be important for the development of IC.

References

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Disclosures

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