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DIAGNOSTIC VALUE OF URINE CYTOKINE LEVELS IN WOMEN WITH OVERACTIVE BLADDER.

Hypothesis / aims of study

Overactive bladder (OAB) is a syndrome characterized by urinary urgency, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence, in the absence of urinary tract infection or other obvious pathology [1]. The etiology and pathophysiology of this syndrome remains unclear. The previous studies reported the signs of immune-mediated inflammation in bladder biopsy specimens from OAB patients [2]. Cytokines are regulatory proteins produced by leukocytes and play a central role in the regulation of immune and inflammatory response. There is evidence of increasing levels of IL-1β, IL-8, TNF-α in biological fluids in patients with chronic prostatitis/chronic pelvic pain syndrome [3].

The aim of the study was to investigate the pathogenic role of the bladder inflammation in the development of OAB in women by determining the urine levels of cytokines and chemokines.

Study design, materials and methods

The urine levels of Interleukin-1β (IL-1β), Interleukin-8 (IL-8), Interleukin-4 (IL-4), tumor necrosis factor alpha (TNFα), monocyte chemotactic protein-1 (MCP-1) were investigated in 107 female patients with OAB and 29 asymptomatic control women. The diagnosis of OAB was based on a history of urgency, frequency (more than 8 urinations per 24 hours) with or without urinary incontinence. The severity of the symptoms and quality of life were assessed according to the validated scales: Indevus Urgency Severity Scale (IUSS) and Overactive Bladder questionnaire (OABq). Patients with OAB did not have any neurologic disease or urinary tract infection (urine analysis is not defined pyuria or bacteriuria). The midstream urine specimens were analyzed for IL-1β, IL-4, IL-8, TNFα and MCP-1 using an enzyme-linked immunosorbent assay.

Statistical significance was determined using Student's t-test with $P<0.05$ considered to indicate statistical significance. Analysis of the relationship between signs performed by calculating the Pearson correlation coefficient (r).

Results

The study found the statistically significant increase in the urine levels of IL-8 and MCP-1 in OAB patients relative to controls ($P<0.05$). The mean (sd) urine level of IL-8 in patients with OAB was 14,19 (3,22) pg/ml and exceeded its level in the control group 6,12 (2,05) pg/ml. The mean (sd) urine level of MCP-1 in OAB patients was 111,13 (24,80) pg/mL, in the control group - 60,16 (15,27) pg/ml. A more detailed study of the data on urinary cytokines that exceeded normal values in OAB patients revealed that high urine concentration of IL-8 and / or MCP-1 were observed in 38 (35.51%) patients. The elevated levels of both IL-8 and MCP-1 were observed in 18 (16.82%) patients. Elevated level of IL-8 only was found in 3 (2.80%) patients, and MCP-1 in 17 (15.88%) patients.

The urine levels of the IL-1β, I-L4 and TNFα in OAB patients were not statistically significantly different from control values.

The urine levels of IL-8 in patients with OAB correlated directly with the average number of urination per 24 hours ($r=0,79$, $p=0,01$). The urine levels of MCP-1 also correlated with the average number of urination per 24 hours ($r=0,51$, $p=0,04$).

Interpretation of results

Obtained results suggest that bladder inflammation can be a possible factor in the pathogenesis of the OAB in at a certain number of patients. Increased levels of IL-8 and /or MCP-1 in urine may be considered as biomarkers of immune-mediated inflammation in the bladder wall that can lead to the development of OAB.

Concluding message

Determining the levels of IL-8 and MCP-1 in urine is appropriate to include in the algorithm of examination of female patients with OAB to detect the immune-mediated inflammation in the bladder and select pathogenetically substantiated therapy.

References

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