52

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REDUCED EXPRESSION OF STEM CELL MARKER CD44V9 IN UROTHELIAL BASAL CELLS IN PATIENTS WITH INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME

Hypothesis / aims of study

Although the aetiology of interstitial cystitis/bladder pain syndrome (IC/BPS) is still not known, one of the most consistently found histopathological changes is erosion or thinning of the bladder epithelium, which may contribute to urothelial dysfunction in IC/BPS patients. However, the mechanisms inducing urothelial dysfunction in IC/BPS is still not fully clarified although the antiproliferative factor (APF) identified in the bladder epithelial cells from IC/BPS patients may be a contributing factor [Ref.1]. CD44, a major adhesion molecule for the extracellular matrix, has reportedly been increased in the bladder from IC/BPS patients [Ref.2]. Recent studies also showed that the CD44 variant isoform 9 (CD44v9) is identified as a marker of epithelial cells with stem cell-like activity [Ref.3]. Here, we examined the expression of CD44v9 as well as other epithelium-related markers such as E-cadherin and cytokeratin in the bladder epithelium from patients with IC/BPS.

Study design, materials and methods

Bladder mucosal biopsies were performed in 15 IC/BPS patients (10 females and 5 males) after hydrodistention during cystoscopic evaluation. Normal bladder mucosae (control) were obtained from 10 patients (6 females and 4 males) after surgeries for stress urinary incontinence or benign prostatic hyperplasia. Immunohistochemical staining for CD44, CD44v9, E-cadherin and wide-cytokeratin as well as hematoxylin-eosin (HE) staining were performed in each bladder specimen.

Results

In the HE staining, erosion, thinning of the bladder epithelium, urothelial vacuolation and/or a decrease in epithelial basal cells were found in IC/BPS specimens (Fig.2) compared with controls (Fig.1). The staining intensity of CD44v9, which were predominantly expressed in bladder epithelial basal cells, was lower in IC/BPS specimens (Fig.2) than in control specimens (Fig.1) whereas the expression of CD44 was detected not only in bladder epithelial basal cells but also in submucosal area. In addition, the staining intensity of E-cadherin and cytokeratin was also lower in IC/BPS specimens (Fig.2) compared with controls (Fig.1).

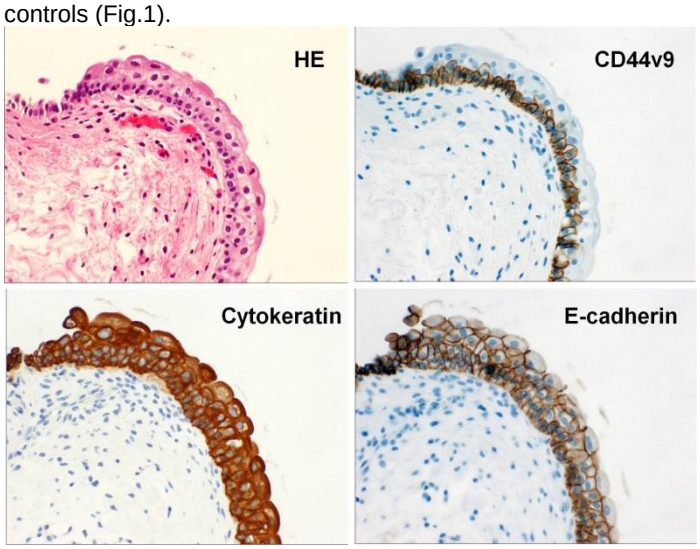

Fig.1. Representative photomicrographs showing expression of HE, CD44v9, cytokeratin and E-cadherin in the control patient.

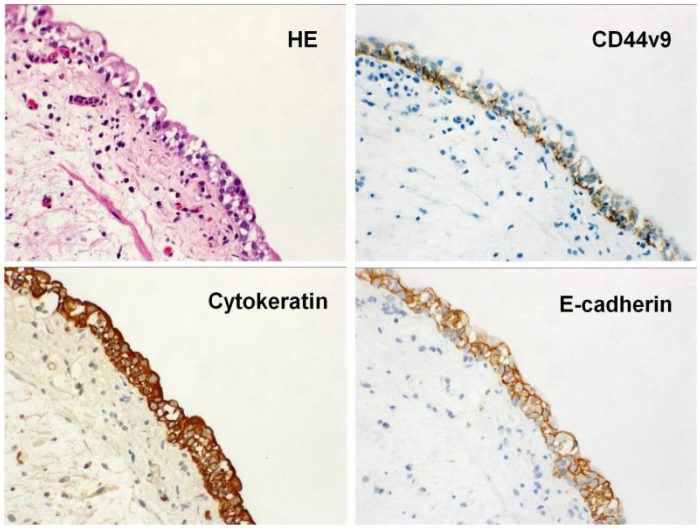

Fig.2. Representative photomicrographs showing expression of HE, CD44v9, cytokeratin and E-cadherin in the IC/BPS patient.

Interpretation of results

These results suggest that histological findings in the bladder epithelium such as erosion, thinning or vacuolation are associated with decreased expression of CD44v9 in urothelial basal cells in IC/BPS patients. Because CD44v9 is one of the markers of epithelial cell with stem cell-like activity, the reduction of CD44v9 expression may contribute to decreased regenerative function of the bladder epithelium in IC/BPS.

Concluding message

Reduced expression of CD44v9 in the bladder epithelial basal cells may be an important pathophysiological basis for urothelial dysfunction in IC/BPS.

References

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Disclosures

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