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THE DECREASED EXPRESSION OF URETHRAL CAVEOLIN-1, -2, AND -3 IN OVERACTIVE BLADDER RAT MODEL OF CYCLOPHOSPHAMIDE (CYP)-INDUCED CYSTITIS

Hypothesis / aims of study

To investigate the localization and expression of CAV-1, -2, and -3 in the urethra in an overactive bladder (OAB) rat model with cyclophosphamide (CYP)-induced cystitis.

Study design, materials and methods

Female Sprague-Dawley rats were divided into the control group (n = 20) and the cystitis group (n = 20). The cystitis was induced by an intraperitoneal injection of CYP (200 mg/kg). After three days of CYP injection, urodynamic study was done to measure the contraction interval and contraction pressure. The cellular localization and expression of CAV-1, -2 and -3 in rat urethra were determined by immunohistochemistry (IHC) and Western blot.

Results

Cystometry experiments demonstrated a shorter contraction interval (minute) in the group of cystitis (3.9 ± 1.0) than the control (6.6 ± 1.2) ($P < 0.05$). Conversely, the contraction pressure (mmHg) was significantly increased in the cystitis group (22.4 ± 0.7) compared to the control (11.5 ± 0.4) ($P < 0.05$). IHC showed that CAV-1 and CAV-2 were located in the suburothelial capillaries, venules and smooth muscle whereas CAV-3 expression was located in urothelium and smooth muscle. The IHC and Western blot data showed that the expression of CAV-1, -2 and -3 was significantly decreased in the group of cystitis compared with the control ($P < 0.05$).

Interpretation of results

Decreased expression of CAV-1, -2 and -3 in the urethra of the OAB rat implies that CAVs might play a crucial role in urethral function during OAB.

Concluding message

Caveolins (CAVs) may be involved in the pathogenesis of various diseases through dysregulation of signal transduction pathways. Regulation of caveolin expression in the urethra may be used in OAB treatment.

References

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Disclosures

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