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γEpithelial Na+ Channel and the Acid-Sensing Ion Channel 1 expression in the urothelium of patients with neurogenic detrusor overactivity

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Both Epithelial Na^+ Channel (γENaC) and the Acid-Sensing Ion Channel 1 (ASIC1) belong to Degenerin/Epithelial Na^+ channel family that represents a new class of cation channels [1]. Increasing evidences show an involvement of these channels in the control of bladder afferent excitability under physiological and pathological conditions [2]; however, data available on their expression in human urothelium are controversial. Pathogenesis of the neurogenic detrusor overactivity (NDO), one of the most severe disabilities reported in patients with spinal cord lesions (SCL), has been attributed to bladder afferent dysfunction. Therefor, the aim of the present study was to investigate the expression of γENaC and ASIC1 in control urothelium and NDO patients. Controls and SCL patients with a clinical diagnosis of NDO underwent to urodynamic measurements and cystoscopy. Cold cup biopsies were processed for immunohistochemistry and western blots. In controls, γENaC and ASIC1 were expressed in the urothelium with different cell distribution and intensity. In NDO patients, both markers showed consistent changes in their cell distribution and intensity. Moreover, a significant correlation between the higher intensity of γENaC expression in urothelium of NDO patients and lower values of bladder compliance was found. In conclusion, the present findings show important changes in the expression of γENaC and ASIC1 in NDO human urothelium. Of note, while the changes in γENaC might impair the mechanosensory function of urothelium, the increase of the ASIC1 might represent an attempt to compensate excess in local sensitivity.

References

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Keywords

Degenerin family, spinal cord lesion. cystoscopy, urodynamic parameters, Immunohistochemistry, western blot.