

Morphological changes in the bladder of spinal cord injured patients affected by detrusor overactivity

¹ Chiara Traini - ² Jacopo Frizzi - ² Sergio Serni - ³ Giulio Del Popolo - ¹ Maria-Giuliana Vannucchi

¹ University of Florence, Department of Experimental and Clinical Medicine, Research Unit of Histology and Embryology, Florence, Italia ² University of Florence, Department of Urology, Florence, Italia - ³ University of Florence, Department of Neurourology, Florence, Italia

It is well known that the neurogenic detrusor over activity (NDO) represents one of the most disabling condition in patients with suprasacral spinal cord injury (SCI). The treatments with anti-muscarinic drugs and botulinum toxin local injection show a temporary efficacy in controlling the bladder impairment; after that, the typical NDO urodynamical signs, such as reduced bladder capacity, high intravesical pressure with potentially upper urinary tract damage, reoccurs (1). At this stage, these patients can choice to perform a cystectomy with or without bladder augmentation. In order to investigate the pathological remodelling of bladder wall, we collected bladder specimens from SCI patients underwent to cystectomy. Control specimens were obtained from patients underwent to surgery for bladder cancer. Data obtained from clinical records, histology and immunohistochemistry were paralleled. The group of SCI patients were uniform on the basis of age, legion level, previous therapies and urodinamic parameters. These latter indicated a strong reduction of bladder capacity and reflex volume. Histologically, SCI bladder showed an important inflammatory state with oedema and congestive blood vessels in the submucosa and lamina propria; in the most serious cases, phlogosis was present also in the detrusor and characterized by eosinophilic infiltrate. Moreover, an important alteration of smooth muscle cell organization was appreciable. The immunohistochemical experiments demonstrated a redistribution of alpha-smooth muscle actin filaments (α SMA) in the smooth muscle cells associated with an altered distribution of caveolin 1 (cav1). Present findings show consistent alteration of the contractile structures and molecules that might explain the recurrence of NDO sign and symptoms in SCI patients. It remains to understand whether these changes are side effects of pharmacological therapies or instead the typical evolution of the disease that the therapies, eventually, postponed.

References

- [1] Del Popolo et al. (2012) Controversy over the pharmacological treatments of storage symptoms in spinal cord injury patients: a literature overview. *Spinal Cord* 50, 8; doi: 10.1038/sc.

Keywords

Spinal cord injury; neurogenic bladder over activity; actin remodeling.