

507

van der Horst C¹, Seif C¹, Böhler G¹, Stübinger S H¹, Naumann C M¹, Wefer B¹, Braun P M¹, Jünemann K P¹

1. Department of Urology and Pediatric Urology

MEMBRANEOUS URETHRA RESPONSE TO ELECTROSTIMULATION OF THE PERIPROSTATIC CAVERNOUS NERVES IN THE MALE RABBIT

Hypothesis / aims of study

The pathophysiology of post-prostatectomy incontinence is supposed to be multifactorial and the impact of the neurovascular bundles on the urethral sphincter function is still under debate. This study was carried out to clarify the impact of the cavernous nerves on the function of the membraneous urethra (MU). Electrophysiological stimulation trials on the periprostatic neurovascular bundles were compared to pudendal nerve stimulation regarding the MU pressure responses in the male rabbit.

Study design, materials and methods

Six male rabbits (chinchilla bastard) were included in this study. In all animals the pudendal nerve as well as the cavernous nerve branches were exposed bilaterally. Randomized electrostimulations of the pudendal nerve fibres and of the cavernous nerves (confirmed by erectile response) were carried out using a biphasic signalform (0.3 mA, 200µs). The stimulation frequency was changed in a randomized pattern from 10 Hz to 40 Hz. Changes of the MU pressure were measured urodynamically via a transurethral microtip catheter placed in the MU. The stimulation response of both nerve structures were compared to each other.

Results

The median baseline pressure of the MU without stimulation was 23 cm H₂O (range 20–25 cm H₂O) in all animals. During unilateral pudendal stimulation, the median pressure response rose highly significantly ($p < 0.005$) to 33 cm H₂O (10 Hz), 43 cm H₂O (20 Hz), 59 cm H₂O (30 Hz) and 60 cm H₂O (40 Hz). Stimulation of the cavernous nerves in contrast did not result in any significant changes of the proximal urethral pressure (median 23 cm H₂O; range 20–25 cm H₂O) compared to the baseline pressure ($p > 0.05$).

Interpretation of results

The primacy of the pudendal nerve in the innervation of the urethral sphincter is well known and was confirmed by our results. Stimulation of the cavernous nerves, by contrast, did not produce any pressure changes in the MU.

Concluding message

These results confirm that the neurovascular bundles have no functional impact on the function of the MU.