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Title (type in CAPITAL LETTERS)	INFLUENCE OF SACRAL NEUROMODULATION ON ELECTROSENSATION IN THE LOWER URINARY TRACT.

**Aims of study :** To investigate if S3 neuromodulation influences the sensory threshold for electrical constant current stimulation in the lower urinary tract.

**Methods :** Ten patients are treated with S3 neuromodulation (210  $\mu$ s, 25 Hz, continuous) with PNE electrode (Interstim Medtronic) introduced transcutaneously. After a mean of 5 days they are prospectively included in the study presented here after informed consent. They are 7 female and 3 male patients, mean age 49 years old (from 24 to 68 years old). The neuromodulation is used to treat urinary retention in 6 women, for bladder overactivity in 1 woman and in the 3 men. Neuromodulation is done unilaterally in 5 and bilaterally in the other 5 with separate stimulation boxes in the latter. The sensory threshold is determined with electrodes put against the mucosa of the empty bladder left and right side and the urethra in female patients, in the empty bladder left and right side, the prostatic and penile urethra in the male patients. A constant current of 0.5 ms impulses and 95 Herz is used. The different thresholds are measured at least 3 times in each location and with the neuromodulation on and off. In patients with bilateral neuromodulation the thresholds are determined with the neuromodulation turned off alternatively on one side and finally on both sides. Comparison between thresholds are done with non parametric tests.

**Results :** Thresholds are evenly reproducible in all locations independent of the neuromodulation. With bilateral neuromodulation, all 5 patients have a lower threshold than without neuromodulation (mean 4,98 mA  $\pm$  2,12 versus mean 11,52 mA  $\pm$  13,7; p = 0,046). In the 4 patients with left neuromodulation, left bladder thresholds are lower with neuromodulation on than with neuromodulation off (mean 2,2 mA  $\pm$  0,26 versus 5,12 mA  $\pm$  1,52). There is no change in right bladder threshold. In the man with right neuromodulation the right bladder threshold changes from 2,6 mA to 7,4 mA when neuromodulation is stopped. In 2 patients with bilateral neuromodulation no change in ipsilateral threshold is found when neuromodulation is unilaterally stopped. In patients where bladder threshold is measured immediately after neuromodulation is restarted, no immediate change in threshold is seen. No changes are found in thresholds in the prostatic, the penile and the female urethra. No change is seen in threshold on the forearm. Neuromodulation proved succesfull in 6. Both in these patients as in those without success influence on threshold can be seen.

**Conclusions :** The results in this study suggest that S3 neuromodulation has an influence on the nervous system involved in electrosensation in the bladder. Sensory threshold measurement with the parameters used here runs through C fibres and most probably the afferent pelvic nerves. This finding, if confirmed in a larger group of patients, can give additional arguments that neuromodulation works through influencing the afferent nervous system as previously suggested [1-2].

1. World J Urol 1991; 9 : 142-144.
2. Urol Clin N Am 1991; 18 : 393-407.