443

Van Meel T D[1], Wyndaele J J[1]
1. *University Of Antwerp / University Hospital Of Antwerp*

STANDARDISED EVALUATION OF ELECTRICAL PERCEPTION THRESHOLDS OF THE BLADDER IN NEUROGENIC PATIENTS

Hypothesis / aims of study

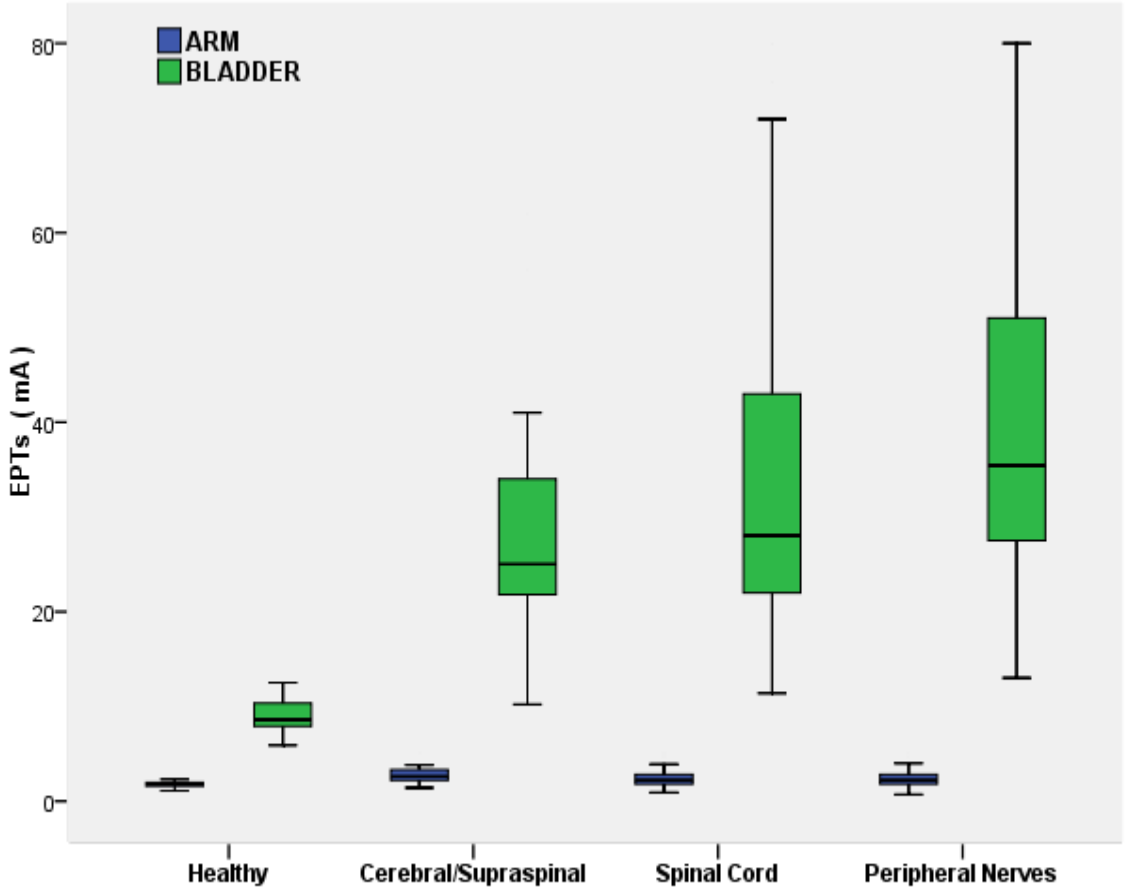
Electrical stimulation is widely used in neurophysiology and has been successively applied in diagnostic and therapeutic approaches for neurogenic lower urinary tract (LUT) dysfunctions(1). The determination of the electrical perception thresholds (EPTs) permits to investigate afferent LUT pathways and has been proposed to detect and differentiate neurologic bladder dysfunction. Our study evaluates, prospectively, differences between the EPT levels of the bladder in patients with an incomplete neurogenic pathology localized in different parts of the nervous system.

Study design, materials and methods

A total of 217 female and 172 male patients aged between 15 and 87 years old with a known incomplete neurogenic bladder dysfunction were included in this study. Three diagnostic groups were made: a “cerebral/supraspinal” group (n=41), a “spinal cord” lesion group (n=197) and a “peripheral nerves” lesion group (n=151) depending on the location of the neurological deficit. All patients attended the urodynamic clinic as part of their diagnostic work-up. All were fully cooperative. Before the EPT evaluation urine analysis was done to exclude urinary tract infection.
All patients were evaluated using a standardized protocol. EPTs were determined on the left arm using surface electrodes. For determination of the EPTs in the bladder, a 8Fr pace catheter was introduced in the partly filled bladder while the patients were positioned in the supine position on a urological table(2). The stimulation electrodes were visualized by radioscopy to ensure a correct positioning and then fixed. A constant current of 2.5 Hz was used for stimulation. EPTs were determined using the method of limits.
The same testing was done in 16 healthy volunteers.
After these tests a single dose of 3 mg fosfomycin was given orally to prevent LUT infection. Computerised statistical analysis was done with nonparametric tests (Wilcoxon test). Values of $P<0.05$ were considered statistically significant.

Results

In 72 patients, 48 female and 24 male, no stimulation could be felt even with a stimulation of 80mA. There was no significant difference between the diagnostic groups in absence of sensation. In the group with sensation of stimulation ≤ 80mA, EPT determination in the bladder differed significantly between the “peripheral nerves” group and the “cerebral/supraspinal” group ($p<0.003$) and between the “peripheral nerves” group and the “spinal cord “ group ($p<0.021$). The significantly higher CPTs in the “peripheral nerves” group are shown in figure 1.
In healthy volunteers all felt electrical stimulation. The EPTs were significantly lower than in all neurologic groups. ($p < 0.0001$)



No significance difference was found with the determination on the arm.

Interpretation of results

Our data show again that in case of neuropathy the EPTs are higher than in healthy volunteers independent of the level of lesion. Moreover in patients with an incomplete neurogenic bladder dysfunction, EPTs differ significantly depending on such level of neurologic lesion. Suprapontine and suprasacral spinal cord lesions act quite similar in contrast to sacral-subsacral lesions who show a substantial increase on EPT determination in the bladder.

Concluding message

Standardized EPT measurement in the bladder is a valuable electrodiagnostic test for the detection and for the differentiation of neurologic pathology with neurologic bladder dysfunction.

References

1. Br J Urol (1993) 72:575-579
2. Neurourol and Urodyn (2003) 22:118-122

Specify source of funding or grant	**NONE**
Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Local ethics committee of the University of Antwerpen**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**