

## PERCUTANEOUS TIBIAL NERVE STIMULATION AND SHORT LATENCY SOMATOSENSORY EVOKED POTENTIALS: PRELIMINARY REPORTS

### Hypothesis / aims of study

Percutaneous Tibial Nerve Stimulation (PTNS) is a relatively new neuromodulation modality used to treat overactive bladder, chronic pelvic pain, non-obstructive urinary retention, but is quite difficult to decide which patient can get good results from this therapy, also because its mechanisms of action are not completely clear.

We've decided to monitor pudendal SEP during PTNS to have an objective parameter to be used to see if something in primary somatosensory cortex changes and if it can help us to better understand the mechanism of action of this therapy and to anticipate us the best responders.

### Study design, materials and methods

We have studied 9 patients (range 21-70 mean age 55), 7 men and 2 women who have had PTNS for overactive bladder almost six months before. We have utilized micturition diary, King's Health Questionnaire, Life Satisfaction Questionnaire and Global Clinical Impression (GCI) to evaluate results from treatment with PTNS.

We have registered evoked pudendal SEP using the international System 10-20 with recording electrode 2 cm behind Cz, stimulating on the same side of application of PTNS. For pudendal SEP we have used for frequency band 1Hz and 3 KHz with stimulation frequency of 3 Hz

The PTNS parameters were pulses of 200 microsecond duration of 0-10 mA current intensity, with frequency of impulses of 20Hz; total duration of treatment was of 30 minutes.

We have recorded pudendal SEP in three conditions:

- With PTNS switch off telling the patients it was turned on
- with PTNS switch on, telling the patients it was turned on, during the first five minutes and during the last 5 minutes of stimulation.

### Results

First of all there isn't any modification of pudendal SEP due to PTNS in five patients; for the other three ones the evoked potential becomes quite scatter, almost disappears: of these three patients, two were no responders and one best responder.

Two patients got good results from the therapy (> 50%); two patients didn't get any results; 4 patients got partial results (<50%).

There is no apparent correlation between clinical outcome and neurophysiological data considering latency, amplitude and morphology of pudendal SEP.

### Interpretation of results

We can say that pudendal SSEP show relevant modification at the beginning and at the end of PTNS only in few patients but we don't know what the meaning of these data is.

From our study the only parameter that can be useful to select candidate is age, because it seems that for younger patients you get better results.

For the future research could be more useful registering pudendal SSEP before the whole PTNS applications and at the end of them, to see if there's any difference in primary sensory cortex evoked potentials.

### Concluding message

These few data show us once again the complex mechanisms regulating bladder activity: it has to be better understood to decide which neurophysiological parameters are the best to be studied.

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**HUMAN SUBJECTS: This study did not need ethical approval because not necessary but followed the Declaration of Helsinki Informed consent was obtained from the patients.**