

EFFICACY AND NEUROPHYSIOLOGICAL EVALUTATION IN MULTIPLE SCLEROSIS PATIENTS TREATED WITH PERCUTANEOUS TIBIAL NERVE STIMULATION

Hypothesis / aims of study

One of the two objectives of this study is to evaluate efficacy and impact on quality of life of SANS on patients with multiple sclerosis (SM) who have storage LUTS.

The other is to determine whether stimulation of tibial nerve through the SANS can positively influence somatosensory afferents that reach the parietal cortex. For this reason, all patients had somatosensory evoked potentials (PESS) in the lower limbs with stimulation of the posterior tibial nerve.

This exam is one of the neurophysiological tests that represent the required integration to morphological and functional assessment in sacral area dysfunctions; by means of application of neurophysiological tests identifying site, type and degree of neurogenic lesion, the diagnosis of neurogenic alteration is allowed.

Specifically, the PESS by stimulation of tibial nerve evaluate the integrity of the somatosensory street and are used in combination with PESS by electrical stimulation of branch of the pudendal nerve for patients with bladder dysfunction, such as multiple sclerosis. The stimulation of the pudendal nerve is compared with that of the tibial nerve, because if it is normal while the cortical potential obtained by stimulation of the pudendal nerve is delayed, you can concentrate on any peripheral damage

Study design, materials and methods

14 patients (10 women and 4 men) with SM and storage LUTS (urgency, nocturia, urge incontinence), mean age 56,3 (range 42-70) unresponsive to therapy with anticholinergic drugs were treated with SANS for 10-12 weeks (sessions of 30 minutes each, 3 times a week), through the application of two adhesive electrodes just above the medial malleolus of the left ankle. For electrical stimulation, with duration pulse of 200µsec and rate of 20 Hz, was used an apparatus Neurotrac Pelvitone (Medimar). It has increased the intensity of stimulation to the plantar flexion of the big toe or the opening range of the other four fingers that testify to the correct position along the course of the posterior tibial nerve.

For all patients were collected data on disease (EDSS scale, year of onset, drug therapy and urological valuation scale). Were administered at the beginning and the end of treatment a questionnaire on health status (EQ-D5), one of quality of life (OAB-Q); the neuropsychometrics tests MMSE, ADL, IADL to assess the degree of cognitive impairment and management autonomy. All completed the voiding diary for 3 days at the beginning and the end of the cycle, to assess frequency and urgency of micturition episodes. Finally we used the PGI (Patient Global Impression) at the end of the treatment to validate or not the perception of the improvement of LUTS.

Before and after a course of SANS were performed somatosensory evoked potentials (PESS) lower limbs with stimulation of the posterior tibial nerve behind the median malleolus, and derivation with surface electrodes in the cortex on CZ-2cm/FZ (according of international system 10-20 for EEG).

The gradual increase of the intensity of stimulation yielded similar motor response of SANS. Were then collected data on the potential expressed by the latency of the cortical P40 component (range 36-40 msec). For recording we used a electromyograph Micromed.

Results

The score EDSS for all patient was <6, and 3 non-responders had a sensory and motor deficit, however the feet. There are therefore a good candidates for the SANS.

60% patients had a significant reduction in daily micturition frequency (from 11 to 7) and of sense urgency micturition (from 11 to 6); reduction in nocturia (from 3 to 1) with a consequent reduction in the number of PAD used daily (from 9 to 4). Significant improvement in quality of life, highlighted by the score of OAB-Q (<50%), and increase in the health status documented by the questionnaire EQ-5D (from 4 to 7).

A reduction of the score (40%) was obtained in tests neuropsychometrics ADL and IADL. No changes highlighted the MMSE. The PGI score show a marker improvement in the perception of well-being in 70% of patients.

The PESS register first cycle of SANS are altered in 86% of patients, with increased latency of the central component P40 of 17% compared to the normal range. Only in 25% of patients were obtained of the change positive but not significant ($p > 0,05$) of cortical potential (P40) recorded at the end of treatment. In all patient all the time of registration was obtained plantar flexion of the big toe as a useful marker that demonstrates the proper positioning of the stimulator.

In 3 patients non-responders has not obtained a valid big toe plantar flexion.

During treatment with SANS in one patient experienced a reduction up to disappearance of Babinsky reflex in the limb ipsilateral to the side of stimulation. While in the contralateral remained. This could be a useful to be reported as an in-depth study could provide further clarification.

Interpretation of results

The SANS is an effective, safe and well-tolerated treatment for LUTS in patients with SM.

Important was the improvement in urgency, and then the quality of life, as patients with SM with impaired walkers and problems of fatigue.

The SANS percutaneous is also effective in patients with neurological deficits as long as there is no mixture of the feet no motor response of the big toe.

The neurophysiological evaluation through PESS showed minimal change (25%) of the cortical potential, perhaps due to the small number of patients. With a greater number could better assess the possible influence of electrical stimulation of the posterior tibial somatosensory pathways through the SANS.

Concluding message

Our experience with SANS in the treatment of urgency-frequency syndrome in patients with SM and LUTS is satisfactory. According to the literature, the use of SANS in the treatment of overactive bladder in efficacy, safety and low expense and increases significantly the bladder capacity and reduced the perception of urgency and we evaluate this a treatment of first line after a medical therapy's failure.

References

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