

NEUROGENIC LOWER URINARY TRACT DYSFUNCTION AND SACRAL NEUROMODULATION – DOES IT WORK?

Hypothesis / aims of study

Neurological disorders often affect the function of the lower urinary tract (LUT) [1]

Depending on the underlying disease various dysfunction can occur, such as detrusor overactivity (DO) detrusor-sphincter dyssynergia (DSD), or chronic urinary retention. Sacral neuromodulation (SNM) is an effective and minimal invasive procedure to reestablish LUT function in patients without underlying neurological disorder, if conservative treatment was unsuccessful [2]. The efficacy of SNM in patients with neurogenic LUT dysfunction (NLUTD), however, has not been clarified.

Aim of this study was to evaluate the effect of SNM in patients with NLUTD.

Study design, materials and methods

In a retrospective chart analysis, we evaluated all patients who underwent SNM (testing and/or permanent implantation) in our institution between 2007 and 2013. Inclusion criteria were a NLUTD evaluated by urodynamic investigation. All previous therapies, treatment outcomes and complications were recorded. Statistical analysis was performed using descriptive data analysis

Results

In the period between 01/2007 and 06/2013, 54 patients underwent SNM at our institution, of which seven patients were excluded due to non-neurogenic LUTD. Thus, 47 patients (87%) 29 women and 18 men, mean age 49 years (33.5 – 55.5), were eligible for further analysis. Cause of the NLUTD was spinal cord injury (SCI) in 30 (64 %), multiple sclerosis (MS) in 3 (6.4%), meningocele (MMC) in 2 (4.3%), and other neurological diseases in 12 (25.3%) patients. Median duration of the underlying disease was 10.1 years (1 - 49). Lesion level in patients with spinal lesions (n=36) was 15x cervical, 9x thoracic, 9x lumbal and 3x sacral. All patients received a test-phase (first stage SNM), 29 (62%) of these received a permanent implantation and the SNM was in use at the last follow-up. Patients with permanent implantation due to DO revealed a significant reduction in voiding frequency/24 h from 8 to 6 ($p<0.0001$). Continence rate was significantly improved after SNM from 9/29 to 24/29 ($p<0.0001$). There was no significant change in urodynamic parameters (maximum bladder capacity, max. detrusor pressure and compliance) when comparing urodynamics before SNM and at the last follow-up. Duration of NLUTD, underlying disease and mobility of the patients were no predictors for a successful test-phase ($p>0.7$). The complication rate was 10/47 (21%), Clavien Dindo Classification grade III (one explantation due to infection, the others due to technical problems). In the follow-up, 27 of 29 patients were very satisfied or satisfied with SNM.

Interpretation of results

SNM seems to be a promising treatment for patients with symptomatic NLUTD without a high risk for upper urinary tract damage, but may not be useful to safely reduce detrusor pressures. This fact seems to be crucial for patient selection

Concluding message

Due to the subjective effectiveness and low complication rate, SNM might be an additional therapy option in patients with NLUTD. However, as we did not observe an improvement in urodynamic parameters, careful patient selection is essential to avoid upper urinary tract damage.

References

1. Panicker, J.N., et al., Lower urinary tract symptoms following neurological illness may be influenced by multiple factors: observations from a neurorehabilitation service in a developing country. *Neurourol Urodyn*, 2010. 29(3): p. 378-81.
2. Siegel, S., et al., Results of a prospective, randomized, multicenter study evaluating sacral neuromodulation with InterStim therapy compared to standard medical therapy at 6-months in subjects with mild symptoms of overactive bladder. *Neurourol Urodyn*, 2014.

Disclosures

Funding: No funding or grant **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Kantonal Ethikkommission Luzern, Switzerland **Helsinki:** Yes **Informed Consent:** Yes