

THE VALUE OF THE AMBULATORY URODYNAMIC STUDY FOR EVALUATION OF TREATMENT EFFECT OF SACRAL NEUROMODULATION

Hypothesis / aims of study

An ambulatory urodynamic study (ambulatory-UDS) is defined as a functional assessment of the lower urinary tract: monitoring storage and voiding, utilising natural filling and reproducing the subject's every day activities [1]. Quantitative and qualitative results of (ambulatory) urodynamic tests are used to justify surgical therapy and to evaluate treatment, however these tests are not validated yet. Since the 1990s sacral neuromodulation (SNM) is a recommended secondary treatment if conservative treatments either fail or lead to insurmountable adverse events in patients with overactive bladder (OAB) syndrome or non-obstructive urinary retention (NOR) [2]. As this treatment is invasive and expensive, a standard testing period is applied in which the treatment results are evaluated, before going onwards to permanent implantation. Currently, only subjective patient reports and voiding diary parameters recommended to take into account. In this study, we investigate the value of ambulatory-UDS as an objective test in comparison to the voiding diary improvement and subjective improvement during the evaluation period in SNM.

Study design, materials and methods

From December 2002 up and until March 2014 a total of 263 patients with lower urinary tract symptoms were included in an ambulatory urodynamic study consecutive database.

Ambulatory UDS was conducted additionally for several reasons: 1) low quality conventional-UDS 2) assumed overactive bladder syndrome without detrusor overactivity on conventional-UDS 3) incontinence with unclear primary origin or 4) suspected bladder acontractility and 5) enuresis nocturna. From this database, a subgroup of patients was selected, who underwent ambulatory urodynamic monitoring prior to and during the test evaluation period for sacral neuromodulation.

Results

In 37 patients a-UDS was performed at baseline and during a sacral neuromodulation testing period. The group consisted of 24 women and 13 men, for more details see table 1.

A positive treatment outcome after test stimulation on semi-subjective parameters, patient report and voiding diaries, correlates well with an improvement on ambulatory UDS and not with an unchanged ambulatory UDS $p < 0.0001$, see table 2.

Almost all (95%; 20/21) patients who showed an improvement of more than 50% on voiding diary parameters and had subjective improvement of symptoms, showed improvement on a-UDS (table 2). One patient with improvement on a-UDS during treatment showed an acontractile bladder at baseline and some micturition contractions during treatment, but reported no subjective improvement or clinically relevant improvement on voiding diaries. On the other hand, of all patients who showed an unchanged recording, 88% (14/16) failed treatment evaluation and did not undergo permanent implantation.

Table 1: Patient characteristics.

Characteristic	Number of patients
Age	47,9 SD 12,6
	51,2 SD 13,5 (men)
	47,5 SD 12,0 (women)
Sex	24 women, 13 men
Storage	6
Voiding	28 (15 with complete retention)
Both	3

Table 2: 2x2 contingency table of the results

SNM treatment*	Ambulatory-UDS outcome		Total
	Unchanged	Improved	
Successful	2	20	22
Failed	14	1	15
Total	16	21	37
Pearson Chi-square test			$X^2 = 25.8$; $df = 1$; $p < 0.0001$
Spearman's correlation (rho)			$\rho = 0.84$; $p < 0.0001$

* Success or failure of SNM treatment is in this table based on the combination >50% improvement in voiding parameters on voiding diary and subjective improvement reported by patients.

Interpretation of results

This study shows that objective improvement on a-UDS, is associated with the semi-subjective earlier criteria for a successful test stimulation i.e. subjective treatment success and voiding diary improvement. Therefore this test might help in the objective evaluation of the test stimulation and hopefully the consecutive success rate. Consequently, it is hypothesized that urodynamic confirmation of treatment success secures long-term success of treatment as placebo effect can be limited.

Concluding message

The improvement in ambulatory urodynamic study recordings can be used in clinical decision making as it is associated with voiding diary improvement and subjective patient perceived improvement during the evaluation period in sacral neuromodulation compared to baseline parameters.

References

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2. Van Kerrebroeck PE, Marcelissen TA. Sacral neuromodulation for lower urinary tract dysfunction. World J Urol. 2012 Aug;30(4):445-50. doi: 10.1007/s00345-011-0780-2. Epub 2011 Oct 12. Review.

Disclosures

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