

SENSORY OR MOTOR RESPONSES: WHICH ARE MORE IMPORTANT FOR PREDICTING THE SUCCESS OF SACRAL NEUROMODULATION FOR THE MANAGEMENT OF VOIDING DYSFUNCTION?

Hypothesis / aims of study

Sacral neuromodulation (SNS) for the management of refractory voiding dysfunction involves two staged procedures. Stage I implantation entails the insertion of a temporary lead(s) into the 3rd sacral foramen to test for nerve stimulation efficacy. Proper lead placement is determined by assessing for motor (anal bellowing, great toe flexion) and sensory (genital/perineal pulsation) responses of the S3 nerve. All responses, however, are not elicited in all patients. A previously published study concluded that motor responses were more important than sensory responses in predicting a successful test stimulation and progression to a stage II (permanent) implantation (1). The purpose of this study is to review our results of stage I SNS to determine if there is a more beneficial type of response (motor versus sensory) in predicting successful implantation.

Study design, materials and methods

We retrospectively reviewed the charts of all patients undergoing staged SNS for the management of refractory voiding dysfunction at our tertiary care institution from 2002 to 2010. Data collected included primary indication for SNS trial (overactive bladder [OAB], urinary retention [UR], pelvic pain [PP]), sacral responses elicited during the stage I procedure and whether or not a successful trial was achieved. Success was defined as $\geq 50\%$ improvement in symptoms based on patient report, voiding diary results and pad testing. The data was stratified by gender, primary indication for SNS trial and presence/absence of neurogenic voiding dysfunction (NGB). Patients with incomplete recordings of sacral responses during the procedure were excluded from analysis. Statistical analysis using logistic regression with Generalized Estimating Equations showed that the correlation between repeated subject observations was close to zero ($p = -0.07$). Therefore, simpler analyses are presented (using the Pearson Chi-square test) in which patients with bilateral SNS lead placement for testing are treated as independent observations.

Results

170 test stimulations were performed on 103 patients (18 male, 85 female). 67/103 had bilateral leads. The primary indication was OAB in 64 patients, UR in 17 patients and PP in 22 patients. Successful stage I test stimulations were noted in 80/170 (47%) leads resulting in 67/103 (65%) patients ultimately progressing to permanent implantation (63% of OAB patients, 59% of UR patients and 77% of PP patients). Both motor and sensory responses were elicited in 139/170 (81%) leads with 71/139 (51%) being successful. Motor only responses were noted in 13/170 (8%) leads with 5/13 (38%) being successful. Sensory only responses occurred in 10/170 (6%) leads with 4/10 (40%) being successful. In 8/170 (5%) leads no S3 responses were noted and none were successful. There were no statistically significant differences between the groups even upon stratification by gender, primary indication and presence/absence of NGB.

Interpretation of results

We could not confirm the results of a prior study that the motor responses are more important than sensory in predicting a successful SNS test stimulation. Instead we found no statistically significant differences between sensory and motor responses, even when stratifying by sex, indication and presence/absence of neurogenic dysfunction. However, given that in the majority of patients both sensory and motor responses were elicited it's possible that a true difference exists but was missed due to sample size. Surgeons should continue to strive to elicit all of the sacral responses when performing the test stimulation, and generally this is feasible.

Concluding message

Based on the present study we were unable to determine if motor or sensory responses were more important in predicting successful SNS test stimulation. In the majority of cases it was possible to elicit both.

References

1. Cohen BL, Tunuguntla HSGR, Gousee A. Predictors of success for first stage neuromodulation: motor versus sensory response. J Urol 175:2178, 2006

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	Medical College of Wisconsin Institutional Review Board
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	No

