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Khunda A[1], Copeland L[2], Anderson C[1], Ballard P[1]
1. James Cook University Hospital, 2. Newcastle University

SACRAL NEUROMODULATION, NOCTURIA AND FACTORS PREDICTING LONG TERM SUCCESS

Hypothesis / aims of study

The wide spread of Sacral Neuromodulation (SNM) has been resisted due to its high cost and the lack of definite criteria which can predict its long term effectiveness. In this project, we try to examine the ability of pre and intra-operative factors to predict long-term success rate of sacral neuromodulation. We also focus on its effect on nocturia; a symptom often linked to morbidity and even mortality especially in the elderly.

Design: Before/ after study of bladder diaries and e-PAQ qustionnaires in patients undergoing sacral neuromodulation

Materials & Methods:

Data was collected prospectively from patients who had sacral neuromodulation at our unit for refractory overactive bladder symptoms and or voiding dysfunction between 2010- 2016. All patients underwent assessment using bladder diaries and the electronic Pelvic Assessment Questionnaire before treatment and at regular intervals after treatment. Wilcoxon Sigend Rank test was use to compare continuous data. Long term success was defined as 50% improvement in the predominant symptom in the latest bladder diary and ePAQ quationnaire (Averaged). When only one assessment was available, it was used.

Results

42 patients underwent a permanent implant. Mean age was 59.6 yrs. Mean follow up was 30.7 months. Data was available from 37 patients. 33/37 continued to enjoy at least 30% improvement in their leading symptom at the final follow up (measured as an average change in objective and subjective measurements) and 21/37 continued to enjoy at least 50% improvement. Average nocturia significantly decreased from an average of 2.06 to 1.17. Pre- treatment median was1.70 (1.12 – 2.87) in 28 patients. Post treatment median of 1 (0 - 2) in 23 patients, P- value = 0.0157. The longest uninterrupted sleep in hours increased from an average of 2.92 in 15 patients to 4.89 in 19 patients . Pre treatment median was 3 (1 - 3.3). Post treatment median was 4.6 (4– 6.5). only 15 patyients had complete both pre and post operative data on longest sleep at night (p- value= 0.66).

In order to find out the factor that predicts long term success with SNM, multiple logistic regression analysis was done. When tested individually only 50% improvement in subjective assessment (using ePAQ) with peripheral nerve evaluation had the ability to predict fifty percent improvement at final visit (p- value = 0.028). None of the following factors significantly predicted 50% improvement at the final assessment: 50% improvement in bladder diary during peripheral nerve evaluation, obtaining both Bellow's and toe flexion reflexes intra-operatively in electrodes 1and 2 , Obtaining best reflexes in the same electrode intra-operatively and the lowest voltage at which the Bellow's and toe flexion reflexes could be obtained. When all the factors were put into a logistic regression model, there was a trend for side of the implant (whether ipsilateral or contralateral compared to the side of peripheral nerve evaluation) to affect the final outcome (p- value= 0.052). However, when all the above factors were out into a backward logistic regression, none displayed a significant effect, apart from 50% improvement in subjective assessment using the ePAQ questionnaire during the 2 weeks SNM test.
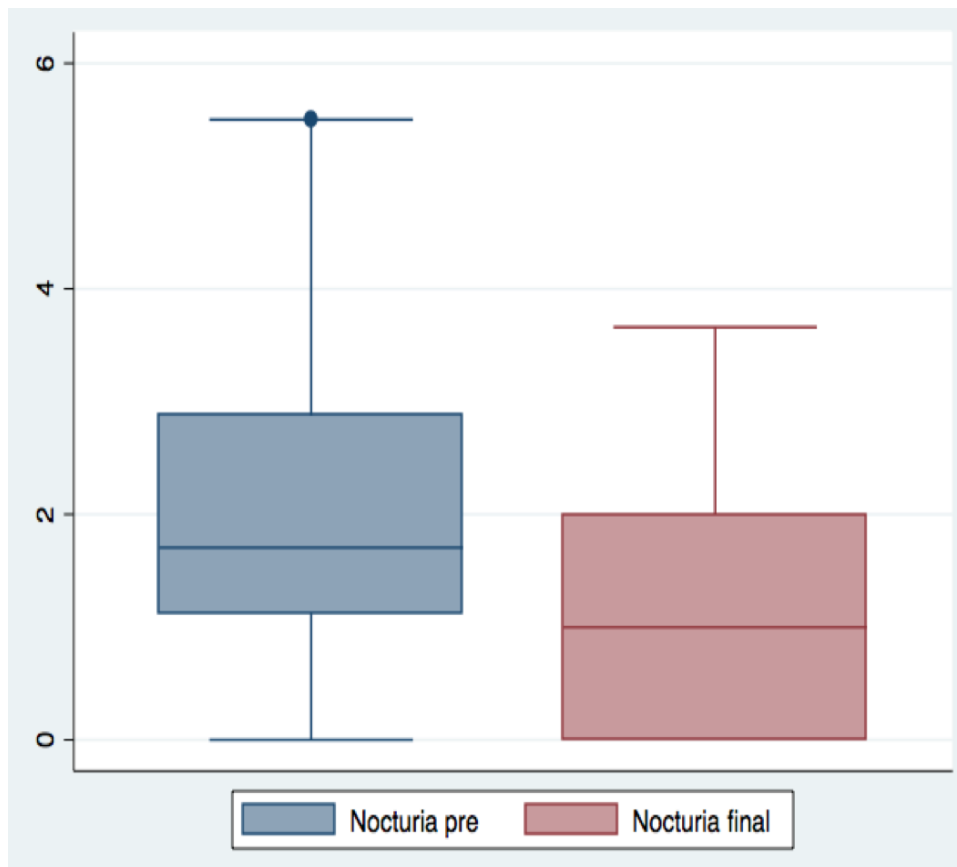
Interpretation of results
Our results show that SNM is effective in treating nocturia, but we failed to demonstrate that it lengthen the longest episode of sleep at night. We believe this was so because only 15 of our patients had complete pre and post treatment data in this respect. Our regression model sufferes from small numbers therefore the findings are exploratory. However, despite the small numbers, subjective assessment using the ePAQ questionnaire was the only factor which was able tp predict long term success. Intra-operative factors do not seem to have much ability to predict long term success. This suggest that SNM has an all or non effect in the sense it will either work or it won't. The ability to produce the Bellow's and the toe flexion reflexes at low voltage intra-operatively does not seem to matter in the long term

Concluding message
SNM is an effective treatment for nocturia. The most important factor in predicting whether SNM will be effective in the long term or not, is the subjective assessment during the 2 week peripheral nerve evaluation.

Disclosures
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