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SACRAL NEURO MODULATION IN CHILDREN WITH NEUROGENIC BLADDER RELATED TO SPINA BIFIDA

Hypothesis / aims of study

The lower urinary tract control is a result of complex interaction between peripheral and central nervous system. Impairment of one of this system may change this balance bringing to neurogenic bladder bowel dysfunction (NBBB) with a negative impact in continence and patients quality of life [1]. SNM is a minimally invasive treatment widely used to treat patients with BBD. The beneficial effect of sacral neuromodulation has been demonstrated in patients with BBD but the effectiveness of this treatment in patients with neurogenic BBD still unclear [2,3]. This probably is related with the type and the side of the lesion. Moreover results of SNM in neurogenic patients is controversial and there is no study in literature regarding the effect of SNM in patients with NBBB related to spina Bifida and still unclear the selective criterion to treat neurogenic patients with SNM [1,3]. The aim of this study is to evaluate and demonstrate the effectiveness of SNM in patients with Spina Bifida comparing to other congenital neurogenic BBD.

Study design, materials and methods

From 2008 onwards 45 pediatric patients have been treated with SNM in our department. All patients were treated according to our protocol approved by our Institute, and when anticholinergic or onabotulinum toxin A were not effective. All patients were operated with a 2 stages surgical procedure.

We have selected and include in the study all pediatric patients with congenital neurogenic bowel bladder dysfunction and divided in two groups: patients with spina bifida and patients with other NBBB. Clinical and urodynamic parameters after and before treatment were analyzed and compared. All patients were treated according to our protocol approved by our Institute, and when anticholinergics or onabotulinum toxin A were not effective. All patients were operated with a 2 stages surgical procedure. All patients were followed up for at least 24 months and the outcomes were evaluated basing on clinical and urodynamic parameters such as bladder diary, the need of CIC, and PVR.

Results

Seventeen patients with a mean age of 14.4 ± 3.0 years old underwent a two-stage SNM implantation. Five patients (29.4%) suffering from spina bifida and 70.6 % n=12 neurogenic bladder not related with spina bifida, The implant was unsuccessful with remotion in 25% (n=3/12) patients with congenital NBBB not related with spina bifida. No rimotion was observed in spina bifida patients. Moreover in this group 1/5 patient underwent the test phase with a scant response and the definitive procedure was not done. The global success rate was observed in 80% (n=4/5) of patients with Spina bifida compared with 75% patients with other NBBB. PVR improvement and the need of CIC were comparable in the two groups with non-statistical significance.

Interpretation of results

The role of SNM in neurogenic patients still controversial. The effectiveness of SNM in spina bifida patients compared with other NBBB has not been previously reported. Improvement in clinical and urodynamic parameters was reported in patients with spina bifida. Despite a better global response in spina bifida the clinical and urodynamic response were comparable in the two group. Moreover is important to see that in Spina Bifida group no removed was observed. This result is related to an improvement of clinical outcomes with an improvement of patients quality of live, suggesting that the implant of SNM in patients with neurogenic BBD is effective with a good clinical and urodynamic response. The role of patient selection should be important to a better management of bladder emptying.

Concluding message

Sacral neuromodulation is an effective treatment in pediatric patients with congenital NBD. Despite a few number of patients results suggested a comparable response in spina bifida patients compared with patients with other neurogenic bladder dysfunction.

References

1. Sacral neuromodulation for neurogenic bladder dysfunction in children. Guys JM, Haddad M, Planche D, Torre M, Louis-Borrione C, Breaud J. *J Urol*. 2004 Oct;172(4 Pt 2):1673-6.
2. Kessler TM, La Framboise D, Trelle S, et al. Sacral Neuromodulation for neurogenic lower urinary tract dysfunction: systematic review and meta-analysis *Eur Urol* 2010, 58: 865-874
3. De Gennaro M, Capitanucci ML, Mosiello G, Zaccara A.: Current state of the nerve stimulation technique for lower urinary tract dysfunction in children. *J Urol*. 2011 May;185(5):1571-7.

Disclosures

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