

A PILOT STUDY ON SANS IN CHILDREN TO TREAT VESICO-SPHINCTER DYSFUNCTION.

Aims of Study

Electrical stimulation of the tibial nerve was first reported by Mc Guire in 1983 (1) in treatment of urge incontinence. In 1987 Stoller demonstrated its efficacy in an experimental model (2) and subsequently in 98 adults to reduce detrusor instability (personal communication). Stoller afferent nerve stimulation (SANS) has been proved to be effective, easy to be performed and well tolerated by adults (3) but no experience has been reported in childhood. We present a pilot study in children with lower urinary tract symptoms refractory to conventional treatment.

Methods

A total of 23 patients (13 female and 10 male) aged 4 to 17 (average 10.8) years have been treated by SANS. The patients, whose bladder dysfunction had been previously unsatisfactorily managed with conventional (drugs and/or bladder retraining) treatments, were grouped as: 10 idiopathic overactive bladder (OB) 1 of whom a valve bladder, 7 non neurogenic detrusor hypocontractility (DH) due to lazy bladder (4) or valve bladder (3), 5 neurogenic bladder (NB), with hypo-areflexic (4) or hyperreflexic (1) detrusor. The remainder was excluded from the evaluation, because discontinued treatment. All patients voided spontaneously except 5 patients (4 NB and 1 DH). Inclusion criteria were: previous treatment stopped at least 6 months before, drugs unmodified (type and dosage) during the study, patient and family's motivation and acceptance of therapy. The SANS workup included 12 treatments (1 session/week). It was carried out using the standard Stoller device, inserting a 34 Gauge-needle into the tibial nerve without local anaesthesia. Stimulation was done for 30 min with a fixed pulse of 200 microseconds and 20 Hz frequency, intensity 1 to 10 mA. All patients underwent voiding diary and standard urodynamics prior and after SANS and the following clinical parameters have been evaluated: daytime urinary incontinence (inc) > 2 episodes/week, night time wetting (NE) > 15 episodes/month, recurrent urinary tract infection (UTI), use of pads. Overall clinical improvement was established based on resolution of at least one symptom. Moreover, in the DH-group straining at voiding (strain) and postvoiding residual urine (res) were observed and calculated; in OB-group were evaluated number of voiding/day (freq) and urgency(urge). Incontinence was graded as poor (drops), moderate (wet underclothes), severe (use of pads or wet clothes) and improving inc was defined when number of episodes and/or quantity of loss decreased. Cistometric bladder capacity (CBC), maximum detrusor pressure (PQmax) and res were evaluated in all patients with detrusor hypocontractility and in hypo-areflexic neurogenic bladder, while CBC and detrusor contractions at filling in the OB-group. CBC was considered normal respect to the formula $[30 \times \text{age (years)} \pm 30]$ and improved residual urine when reduced more than 50% of the CBC.

Results

All 23 patients, but 1, completed the treatment and accepted it well. Overall urinary symptoms prior to the start SANS in the 22 evaluated patients were: 15 inc, 9 NE with associated inc in 8, 9 UTI and 8 children used pads. All 7 patients of DH-group voided with aid of straining and had residuum > 20% of cistometric capacity expected for age. In OB- group average freq. was 9.7 ± 4.9 (range:6-20) and all had urge and inc. At the end of treatment : 5/15 (33%) and 2/9 (22%) were dry respectively during day and night; no UTI was seen in 6/9 (66%); 3/8 (37,5%) patients eliminated pads and 5/7 (71%) avoided strained voiding. Clinical symptoms improved in 2/5 patients with neuropathic bladder (NB), 7/10 with OB and in 4/7 with DH (1 lazy bladder and 3 posterior urethral valves). The remaining patients unchanged. Regarding OB average freq changed from 9.7 at the beginning to 5.7 ± 1.2 (range 4-8) at the end of treatment ($p < 0.03$), urge and inc improved in 4 out of the 10 patients, 2 becoming completely dry day and night. In 5/10 of DH detrusor contraction resolved. CBC was normal at diagnosis in only 3 patients. It became normal in 1/5 patients with NB, 1/7 with DH while in the remaining patients was unchanged. PQmax unmodified in NB and DH. Ten patients showed residual urine > 20% CBC. Of these 5 improved after treatment (1 Lazy bladder, 1 PUV and 3 NB).

Conclusions

Stoller neuromodulation seems effective even in children mainly overactive bladder. Subjective symptoms ameliorated more than urodynamics patterns. However, in order to draw definitive conclusion, we need a larger series and a control group too.

References:

1. Mc Guire E.J., Shi-Chun Z., Horwinski E.R. et al: Treatment of motor and sensory detrusor instability by electrical stimulation. J.Urol. 129:78, 1993
2. Stoller M.L., Copeland S., Millard R.J. et al : The efficacy of acupuncture in reversing the unstable bladder in pig-tailed monkeys. J.Urol, suppl., 137:104A, abstract 2, 1987
3. Govier F.E., Litwiller S., Nitti V., et al: percutaneous afferent neuromodulation for the refractory overactive bladder: results of a multicentric study. J Urol, 165:1193,2001