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IS STOLLER NEUROMODULATION TOLERATED BY CHILDREN?

Aims of Study

Electrical stimulation to treat vesico-sphincteric dysfunction has been extensively used even in children, with contradictory results but without significant side-effects. Among different types of stimulation, the intravesical one needs catheterisation, while stimulation from genitalia and/or perineum it is not easily accepted by small patients and psychologists generally suggest to avoid manipulation over that area. Differently from the above stimulations, which use sensitive pathways, direct stimulations on afferent nerves/roots should have a modulation effect. Even if largely used in adult patients, very few (pilot) studies have been reported with sacral-S3-roots transcutaneous stimulation (1) and, to our knowledge, no experience has been published yet about percutaneous Stoller afferent nerve stimulation (SANS) from tibial nerve. The latter has been demonstrated effective to reduce detrusor instability in an animal model (2) and, subsequently, SANS has been widely used in adults to treat overactive bladder, pelvic floor dysfunction and chronic pelvic pain. Before to start a clinical trial with SANS in children with bladder dysfunction, we decided to check how painful it should be in children and how they and their families should accept this theoretically invasive method of treatment. Thus, we applied tests for pain quantification, administered by a psychologist who would be able to evaluate the level of acceptance in terms not only of pain but also of and stress tolerance.

Methods

The first 10 patients (6 female and 4 male) aged 7 to 15 years (average age 11 ± 3.9) with vesical dysfunction, selected for SANS treatment, because non responsive to were enrolled to the psychodiagnostic evaluation. Two patients had neuropathic bladder, five overactive bladder and three detrusor hypocontractility due to lazy bladder in two cases and posterior urethral valve in 1. The SANS workup included 12 treatments (1 session/week) done by expert nurses in the presence of a psychologist and under urologist's control. It was carried out using the standard Stoller device, inserting a 34 Gauge-needle into the posterior tibial nerve without local anaesthesia. Stimulation was done for 30 minutes with a fixed pulse of 200 microseconds and 20 Hz frequency, selecting within range of 1 to 10 mA. Prior to treatment, one psychologist talked with the family and performed the anxiety-depression test (score: 100-114 not pathologic, 115-129 moderate and 130-145 severe depression). During the SANS workup have been administered either the visual analogue scale (VAS) with score 0 to 10 either the "Italian questionnaire of pain" (QUID) at 1st, 15th and 30th minute of treatment during the first and last session. QUID analyses the sensitive (true pain), affective (stress and frightness) and components of pain perception. Results of the tests have been statistically compared using Student t test. Patients and parents have been asked an opinion on the procedure, compared with other invasive diagnostic/therapeutic ones

Results

All 10 patients but one (who discontinued at 5th session) have finished the SANS program. All patients (and families) who terminated treatment judged it acceptable and preferable to other therapies, 5/9 asking to continue. VAS score was always lower than 3, with average of 1.35 at 1st, 2.12 at 5th and 2.34 at 12th session, while intensity of stimulation was progressively increased along treatment. In all sessions has been observed a statistically significant decrease in pain perception between the first minute and the 30th minute, either at first ($p=0.05$) either at the 12th ($p=0.02$) session. Regarding QUID, at 1st and 12th session, we found a statistically significant decrease for all components of pain perception, sensitive ($p=0.05$), mixed ($p=0.02$) and particularly affective ($p=0.003$) one.

The psychological behaviour was good in 4 of the 10 patient examined, while 6/10 showed anxiety and/or depression of moderate rate, and no correlation has been found between psychological behaviour and pain perception.

Conclusions

SANS has been proven to be well tolerated by school-children, when performed by expert nurses and with attention to psychological aspects, also in non-neurogenic patients with normal afferent pathways. The main component of pain perception seems the affective one, which is determined by external factors more than pain itself. If efficacy will be proven, SANS might become another chance in children with lower urinary tract dysfunction, who do not respond or are intolerance to conventional drug therapy.

References

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