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Parasacral transcutaneous electrical nerve stimulation for overactive bladder in constipated children: The role of constipation

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Summary

Background
Parasacral transcutaneous electrical nerve stimulation (TENS) is an effective method for the treatment of overactive bladder (OAB), and, additionally, it accelerates bowel transit time. Therefore, not only does parasacral transcutaneous electrical nerve stimulation (TENS) improve lower urinary tract symptoms (LUTS), but it also resolves the problem of constipation in a significant number of children. Since TENS has a positive effect on LUTS and on the symptoms of fecal retention, it is possible that its action regarding OAB could be directly associated with the improvement in constipation. In other words, the positive effect of parasacral TENS in OAB would be because constipation was resolved. The objective of this study was to test that hypothesis.

Objective
To test the hypothesis that the positive effect of parasacral TENS in OAB would be because constipation had improved with this method.

Study design
In this prospective study, children with OAB alone were submitted to parasacral TENS. The inclusion criteria consisted of children with idiopathic OAB alone The Rome III criteria for children of 4–18 years of age were used to diagnose constipation. All the children were treated with 20 sessions of parasacral TENS applied for 20 min, three times weekly on alternating days (Figure). No instructions were given to the participants with respect to diet, laxatives, or pharmaceutical treatment for constipation throughout the study period. None of the patients used anticholinergics. Standard urotherapy was prescribed.

Results
Parasacral TENS improves OAB and constipation. The presence of constipation before treatment was not associated with a poorer prognosis insofar as the resolution of the symptoms of OAB was concerned. Likewise, there was no association between the resolution of constipation with parasacral TENS and the resolution of OAB.

Conclusion
There was no statistically significant difference in urinary symptoms between the constipated and nonconstipated children. There was an improvement in urgency, urge incontinency and in holding maneuvers in both the constipated and non-constipated children; however, there was no significant improvement in enuresis. The resolution of OAB was not associated with the resolution of constipation and vice versa.

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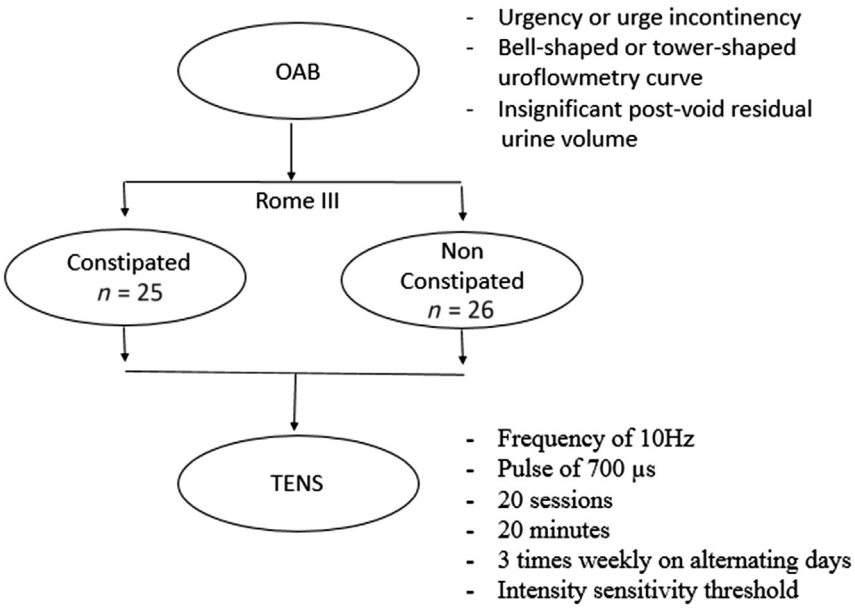

Introduction

The association between constipation and lower urinary tract symptoms (LUTS) in children is well known and referred to as bladder and bowel dysfunction (BBD). BBD is associated with a higher risk of urinary tract infection (UTI) and vesicoureteral reflux [1,2]. Constipation may be associated with LUTS for several reasons: (1) hardened feces retained in the rectum may compress the bladder and bladder neck, contributing to dysfunction of the lower urinary tract; (2) contraction of the perianal muscles used to retain feces may contract the external urethral sphincter, predisposing the individual to increased urinary retention; (3) hypertonic pelvic floor dysfunction may hamper the individual's ability to empty the bladder; (4) contractions of the external urethral sphincter to avoid urinary incontinence may result in contraction of the perianal muscles, predisposing individuals to inhibition of the defecation reflex; (5) overstimulation of the sympathetic autonomic nervous system may reduce intestinal peristalsis; and (6) finally, symptoms may be associated with neurophysiological immaturity with no cause—effect relationship [3,4].

With the chronicity of the symptoms related to constipation, the child consequently tends to inhibit defecation, resulting in emotional repercussions that include a greater degree of anxiety, negative self-image, and withdrawal from social life. Likewise, LUTS is associated with alterations in the internalization and externalization processes [5].

In addition to LUTS, overactive bladder (OAB) with coordinated micturition has also recently been shown to be associated with constipation [6]. Children with OAB are approximately threefold more likely to have constipation than their asymptomatic peers. Therefore, it is essential that both dysfunctions be treated.

Antimuscarinics can be used to treat OAB; however, these drugs have a negative effect on defecation. Our group, as well as other investigators, has demonstrated that parasacral transcutaneous electrical nerve stimulation (TENS) is effective for the treatment of OAB [7,8], and, additionally, it accelerates bowel transit time [9]. Therefore, not only does parasacral TENS improve LUTS, but it also resolves the problem of constipation in a significant number of children [10,11].

Since TENS has a positive effect on LUTS and on the symptoms of fecal retention, it is possible that its action regarding OAB could be directly associated with the improvement in constipation. In other words, the positive effect of parasacral TENS on OAB would be basically because the constipation was resolved. The objective of this study was to test that hypothesis.

Materials and methods

In this prospective study, children with OAB alone were submitted to parasacral TENS. The inclusion criteria consisted of 4—14-year-old children with OAB alone, defined as a complaint of urgency or urge incontinency, and a bell-shaped or tower-shaped uroflowmetry curve. In addition, the post-void residual urine volume had to be insignificant at ultrasonography (i.e., less than 10% of the expected bladder capacity for age in milliliters, estimated as [age + 1] × 30 mL, and less than 20 mL) [12]. Children with neurological or anatomical abnormalities of the lower urinary tract and those with insufficient data for analysis were excluded from the study.

To evaluate the symptoms, a structured questionnaire was used to acquire data about the presence of urgency, urge incontinency, UTI, frequency (more than 7 voids/day), nocturia, holding maneuvers, enuresis, and constipation. UTI was defined as the presence of acute