Home Transcutaneous Electrical Stimulation (TES) to Treat Children with Slow-Transit Constipation

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Abstract Text:

Purpose

Slow-transit constipation (STC) is the most severe form of chronic constipation. Transcutaneous electrical stimulation (TES) is commonly used by physiotherapists to treat pain, muscle weakness and bladder incontinence for > 20 years. In a pilot study, TES increased defecation and colonic motility in children with STC. We hypothesized that TES improves clinical outcomes of children with STC.

Methods

A prospective study of STC children treated with TES at a tertiary pediatric hospital. All children are diagnosed by nuclear transit scintigraphy. Patients were given a portable TES machine and taught to self-administer treatment at home. Bowel diary and PedsQL4.0 questionnaire were administered before and during treatment. Two groups were identified by defecation frequency, >3 Bowel Actions (BA)/wk and < 3BA/wk before treatment. Primary end points were decreased soiling, increased defecation frequency and increased sensation of defecation/urge-initiated defecation. Radionuclear colonic transit studies before and after TES were compared. Study approved by institutional ethics committee.

Results

Thirty-two children (17 female, mean age 8.4yr, range 3-18yr) underwent 3-6 months of TES, and all of them completed the treatment successfully. However, 3 children failed to return completed bowel diaries. Thirty (94%) of the children achieved treatment success.
Nearly all STC children benefited in at least one symptom. At 6 months follow-up, soiling frequency decreased from 5.0 to 2.9/wk (p<0.05). Defecation frequency increased from 1.4 to 3.0/wk in 13 children who started with <3 BA/wk (p=0.02). There was an increase in urge-initiated defecation (from 16 to 22 patients, p=0.09) and decreased abdominal pain (1.6/wk to 0.9/wk, p=0.06). Stool consistency improved towards formed stool (Bristol Stool Scale 4, 15% vs 28%, p=0.06). Following TES, quality of life improved significantly. There was statistically significant improvement in Total PedsQL Scores: Child ≤4yr parent-reported (mean±SD, 72±11 vs 85±10; p=<0.01) and for the group of children age 5-18yr, total PedsQL score: child-reported (64±22 vs 77±19; p<0.01), and parent-reported (61±19 vs 73±18; p<0.01). In child-reported: Physical (69±22 vs 81±18; p<0.01) and Psychosocial Score (63±24 vs 76±21; p<0.01) as well as parent-reported: Physical (65±18 vs 78±19; p<0.01) and Psychosocial Score (59±20 vs 72±18; p<0.01). Colonic transit improved significantly compared to baseline transit studies at 6 hour (mean±SD, 1.5±0.6 vs 1.8±0.4; p=0.03) and at 48 hour (3.6±0.9 vs 4.0±0.9; p=0.04). Only 2 children required appendicostomy formation for washout due to intractable soiling.

**Conclusion**

TES is a well established physiotherapists method for treating pain and muscle weakness and is effective in the treatment of slow-transit constipation. TES is delivered across the skin and is non-invasive. The treatment should be tried before surgery is considered in children with chronic treatment-resistant constipation.