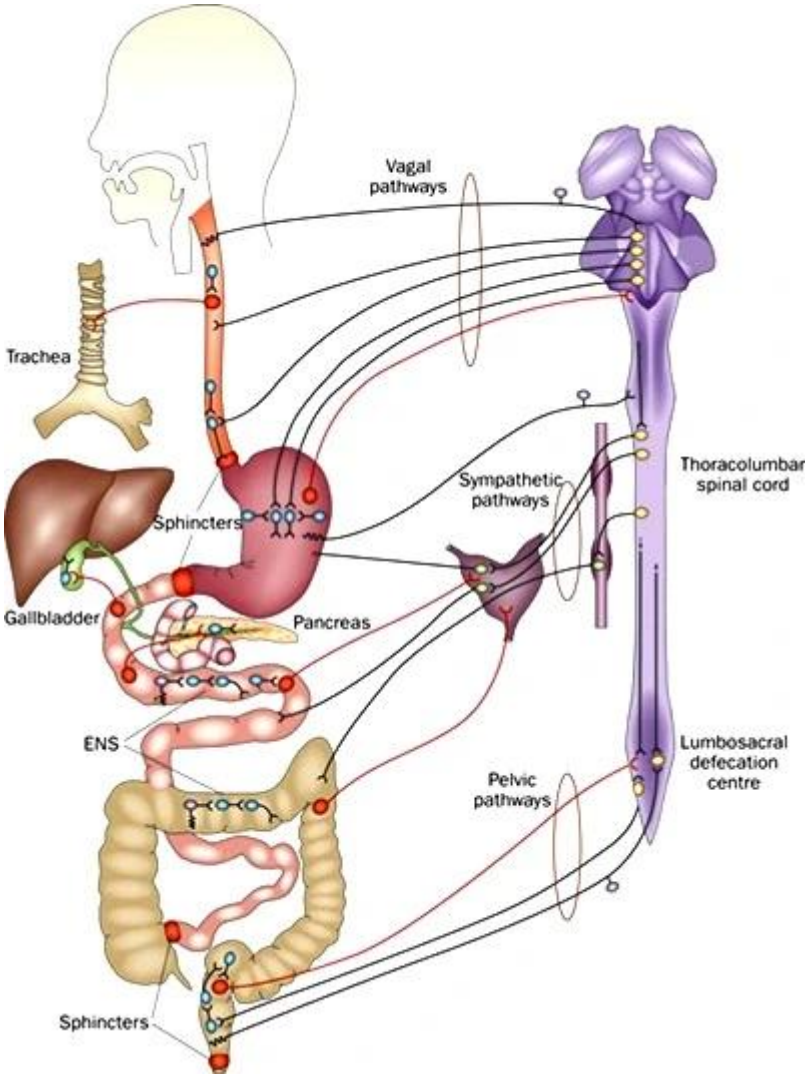
Constipation, i.e. functional bowel disorder, is a common health problem in the first three to six months after delivery, or even up to a year after delivery. Such postpartum constipation is more common after a Cesarean section than after a vaginal delivery. Pharmaceutical treatments in the form of laxatives are effective, but their prolonged use is associated with side effects, such as abdominal pain, diarrhea, and hypoalbuminemia. The most common non-pharmacological treatment for fecal incontinence, overactive bladder syndrome, and constipation are methods of tibial nerve stimulation, Percutaneous Tibial Nerve Stimulation (PTNS), and a non-invasive (without needle puncture) Transcutaneous Tibial Nerve Stimulation (TTNS). In this prospective, randomized, controlled trial, the authors from Egypt investigated the effectiveness of Transcutaneous Tibial Nerve Stimulation as a method for treating postpartum constipation.

Postpartum constipation is attributed to several factors, including high progesterone levels, resulting in hypomotility of the gastrointestinal tract and relaxation of the abdominal muscles, the changes in the pelvic floor muscles caused by high intra-abdominal pressure, luminal obstruction by the enlarged uterus, low-fiber diet, and hemorrhoids that restrict efficient bowel elimination. Some previous studies suggest that improvements observed when using the TTNS, as a method of peripheral neuromodulation, are due to activation of the parasympathetic nervous system and inhibition of the sympathetic nervous system, resulting in improved intestinal peristalsis and reduced constipation.

In the late 1990s, Dr. Marschall Stoller proposed tibial nerve stimulation, initially known as the SANS (Stoller Afferent Nerve Stimulator) protocol, for non-neurogenic lower urinary tract dysfunction. The PTNS and TTNS provide neuromodulation by stimulating the tibial nerve with surface electrodes. The tibial nerve is a mixed nerve (L4-S3) from the same spinal cord segment as the nerves innervating the bladder, lower gastrointestinal tract, and pelvic floor. Previous studies have reported that TTNS may be effective in patients with constipation, even those who have not responded to most conservative therapies, by increasing stool frequency and decreasing abdominal pain, bloating and laxative use.



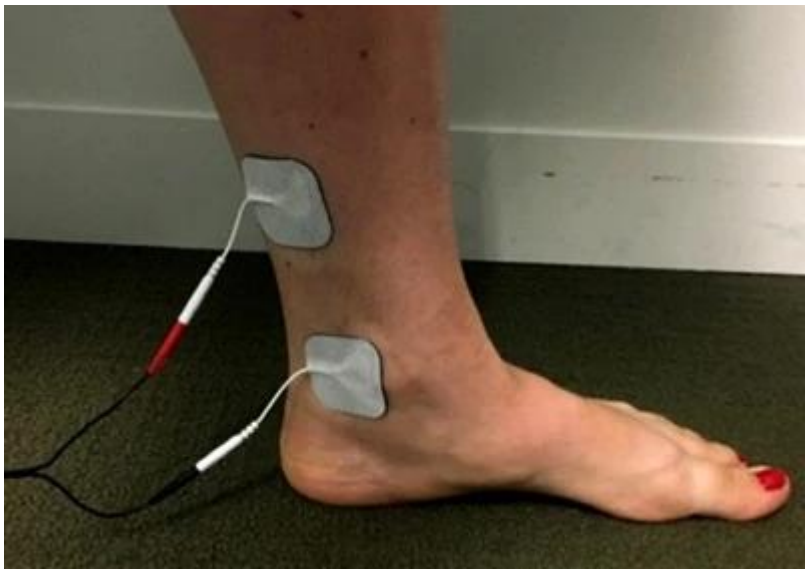
About the Study and Results

This prospective, randomized, controlled trial included 56 postpartum women, randomized to either the TTNS or control group, with 28 participants in each group. The inclusion criteria were delivery by Cesarean section, and constipation occurring during the first week after delivery meeting the Rome IV criteria for constipation. The exclusion criteria were inflammatory bowel disease, irritable bowel syndrome, other digestive tract disorders, anal fissure, congenital anorectal abnormalities, genital organ prolapse, severe distal venous insufficiency, skin eruption at the stimulation site, use of laxatives, diabetes mellitus, an implanted pacemaker, recent lower limb surgery, peripheral neuropathy, and psychological distress.

The women’s age was from 20 to 35 years, and there were no significant differences in the

mean age, weight, height, and BMI between the two groups.

A group treated with TTNS received tibial nerve stimulation in continuous mode with a frequency of 10 Hz and pulse duration of 200 µs for 30 minutes bilaterally. The negative electrode was positioned behind and above the medial malleolus, and the positive electrode was 10 cm above the negative one. Additionally, both groups had breathing exercises and abdominal muscle training. All treatment interventions were administered three times a week for four weeks, with the first session taking place in the first week after delivery.



All participants filled out the questionnaires before and four weeks after the end of the treatment: the Patient Assessment of Constipation Quality of Life Questionnaire (PAC-QOL) that evaluates the quality of life for constipated patients, the Patient Assessment of Constipation Symptom Questionnaire (PAC-SYM) that assesses constipation symptoms, and the Bristol Stool Form Scale (BSFS) that assesses stool consistency.

Results showed that physical discomfort, psychosocial concerns, abdominal, stool, rectal symptoms, total PAC-SYM scores, and total PAC-QOL scores were significantly reduced after treatment in both groups compared to baseline levels. However, except for abdominal symptoms, the TTNS group performed better than the control individuals in all these parameters. There was no difference in abdominal symptoms between the two groups.

In both groups, adverse effects were not registered during the treatment.

Conclusion

The authors emphasize that this study is the first to use bilateral TTNS, a non-invasive treatment without significant adverse effects, to treat postpartum constipation. Bilateral TTNS, integrated with traditional physiotherapy with diaphragmatic and abdominal exercises resulted in greater improvement in constipation symptoms and quality of life than diaphragmatic and abdominal exercises alone.

Because the study lasted only four weeks and there was no follow-up, the authors suggested that further research should determine the effects of bilateral TTNS on postpartum constipation during a longer follow-up period.

Journal Reference

Botla AMM, Saleh MSM, Ahmed WSA et al. Bilateral transcutaneous tibial nerve stimulation: a promising treatment for women with postpartum constipation: A randomized controlled trial. Advances in Rehabilitation, 2024, 38(4), 16–24. https://doi.org/10.5114/areh.2024.144633