Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

The Effect of Bilateral Transcutaneous Tibial Nerve Stimulation on Symptoms of Chronic Functional Constipation by Evaluation of Parasympathetic System through Hemodynamic Monitoring and Salivary Acetylcholinesterase Biomarker

Protocol summary

Study aim

To evaluate the effect of bilateral transcutaneous tibial nerve stimulation on symptoms and quality of life in individuals with chronic functional constipation by assessing parasympathetic activity and comparing it with conventional pelvic floor physiotherapy.

Design

A single-blind, randomized clinical trial involving two groups of 15 patients (control and intervention), utilizing simple randomization through a lottery-based allocation method.

Settings and conduct

Volunteers are randomly assigned to control or intervention groups, blinded to treatment type. Both groups receive CPFP three times weekly for six weeks at Iran University of Medical Sciences. The intervention group will also undergo daily home-based BTTNS. WCSS (Wexner constipation scoring system) and PAC-QOL questionnaires will be completed at baseline, mid-treatment, and post-treatment to assess symptoms and quality of life. Parasympathetic activity and hemodynamic parameters will be measured via salivary acetylcholinesterase, blood pressure, and heart rate variability.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Female aged 20 to 60 years meeting Rome III criteria for chronic functional constipation Exclusion criteria: Presence of an organic pathology for constipation, neurological diseases, peripheral neuropathies, congenital anorectal malformations, anatomical abnormalities requiring surgery، major depression, pregnancy or periodontal disease

Intervention groups

Control group: receiving conventional pelvic floor physiotherapy (CPFP) Intervention group: receiving a combination of conventional pelvic floor physiotherapy and bilateral transcutaneous tibial nerve stimulation (TTNS)

Main outcome variables

1. Clinical symptoms of chronic constipation 2. Quality of life 3. Hemodynamic parameters 4. Salivary acetylcholinesterase levels

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20250812066839N1**
Registration date: **2025-08-26, 1404/06/04**
Registration timing: **prospective**

Last update: **2025-08-26, 1404/06/04**
Update count: **0**

Registration date

2025-08-26, 1404/06/04

Registrant information

Name

Parnian Mirbehresi

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 2222 2059

Email address

pbehresi@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-09-11, 1404/06/20

Expected recruitment end date

2026-01-05, 1404/10/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effect of Bilateral Transcutaneous Tibial Nerve Stimulation on Symptoms of Chronic Functional Constipation by Evaluation of Parasympathetic System through Hemodynamic Monitoring and Salivary Acetylcholinesterase Biomarker

Public title

Tibial Nerve Stimulation in Chronic Functional Constipation

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Female participants aged 20 to 60 years who meet the Rome III criteria for chronic functional constipation

Exclusion criteria:

Currently receiving any other treatment for chronic functional constipation Previous treatment for chronic functional constipation within the past month Presence of any organic disorder known to cause constipation Diagnosis of neurological disorders (multiple sclerosis, Parkinson’s disease, or spinal cord injury) Presence of diabetic neuropathy Presence of congenital anomalies of the anorectal region Presence of anatomical disorders requiring surgical intervention (mucosal prolapse, rectocele, cystocele) as determined by a specialist Suffering from major depression (Beck Depression Inventory score > 30) Use of medications known to induce constipation (e.g., antidepressants, antihistamines, antiepileptic drugs) Previous anorectal surgery Current pregnancy or intention to become pregnant Prescence of periodontal disease

Age

From **20 years** old to **60 years** old

Gender

Female

Phase

N/A

Groups that have been masked

- Participant
- Data analyser

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

The randomization method will be based on simple random allocation rule through lottery-based method. Specifically, 15 balls labeled “A” (control group) and 15 balls labeled “B” (intervention group) will be placed in a container and then drawn one at a time without replacement. The sequence of drawn balls will be recorded, creating a random allocation sequence.

Blinding (investigator's opinion)

Single blinded

Blinding description

Participants will be randomly assigned, without their knowledge, to either the control or intervention group. Accordingly, none of the participants will be aware of the existence of two treatment arms. Additionally, data analysts will remain blinded to group allocation (control vs. intervention) throughout the analysis process.

Placebo

Not used

Assignment

Factorial

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Research Ethics Committees of Iran University of Medical Sciences

Street address

School of Rehabilitation Science, Nezam Ave, Mirdamad Ave, Tehran,

City

Tehran

Province

Tehran

Postal code

1545913487

Approval date

2024-09-03, 1403/06/13

Ethics committee reference number

IR.IUMS.REC.1403.495

Health conditions studied

1

Description of health condition studied

Functional Constipation

ICD-10 code

K59.0

ICD-10 code description

Constipation

Primary outcomes

1

Description

Salivary acetylcholine esterase

Timepoint

Baseline (prior to intervention), midpoint, and end of study

Method of measurement

Collection of unstimulated saliva sample and analysis using an acetylcholinesterase assay kit.

2

Description

Hear Rate Variability

Timepoint

Baseline (prior to intervention), midpoint, and end of study

Method of measurement

Electrocardiography

Secondary outcomes

1

Description

Clinical symptoms of chronic functional constipation

Timepoint

Baseline (prior to intervention), midpoint, and end of study

Method of measurement

Wexner constipation scoring system questionnaire

2

Description

Quality of life

Timepoint

Baseline (prior to intervention), midpoint, and end of study

Method of measurement

Patient Assessment of Constipation-Quality of Life questionnaire

Intervention groups

1

Description

Control group: Participants will receive conventional pelvic floor physiotherapy, which includes biofeedback using a rectal electrode for retraining and strengthening the anorectal muscles, prescription of pelvic floor muscle stretching and strengthening exercises, diaphragmatic breathing instruction, and bowel behavioral therapy. Treatment sessions will be conducted three times per week over a six-week period.

Category

Rehabilitation

2

Description

Intervention group: The intervention will consist of two components initiated concurrently: conventional pelvic floor physiotherapy and tibial nerve electrical stimulation. Conventional pelvic floor physiotherapy includes biofeedback using a rectal electrode for retraining and strengthening the anorectal muscles, prescription of pelvic floor muscle stretching and strengthening exercises, diaphragmatic breathing instruction, and bowel behavioral therapy. Treatment sessions will be conducted three times per week over a six-week period. Tibial nerve electrical stimulation will be administered via a home-use electrical stimulation device for 30 minutes each morning upon waking, continued daily for six weeks.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Hazrat Rasul Akram educational, research and treatment complex

Full name of responsible person

Parnian Mirbehresi

Street address

Hospital of Hazrat Rasool Akram, Mansouri Street, Niyaish Street, Satarkhan

City

Tehran

Province

Tehran

Postal code

1445613131

Phone

+98 21 6435 1243

Email

rasoolhospital@iums.ac.ir

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Iran University of Medical Sciences

Full name of responsible person

Afsoon Hassani Mehraban

Street address

Faculty of Rehabilitation Sciences, Iran University of Medical Sciences, Shah Nazari Street, Mirdamad, Madar Square, Tehran

City

Tehran

Province

Tehran

Postal code

1546913487

Phone

+98 21 2222 2059

Email

mehraban.a@iums.ac.ir

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Iran University of Medical Sciences
Proportion provided by this source
100
Public or private sector
Public
Domestic or foreign origin
Domestic
Category of foreign source of funding
empty
Country of origin
Type of organization providing the funding
Academic

Person responsible for general inquiries

Contact
Name of organization / entity
Iran University of Medical Sciences
Full name of responsible person
Parnian Mirbehresi
Position
PhD Candidate
Latest degree
Master
Other areas of specialty/work
Physiotherapy
Street address
Faculty of Rehabilitation Sciences, Iran University of Medical Sciences, Shah Nazari Street, Mirdamad, Madar Square, Tehran, Iran
City
Tehran
Province
Tehran
Postal code
1545913487
Phone
+98 21 2222 2059
Fax
Email
pbehresi@gmail.com

Person responsible for scientific inquiries

Contact
Name of organization / entity
Iran University of Medical Sciences
Full name of responsible person
Parnian Mirbehresi
Position
PhD Candidate
Latest degree
Master
Other areas of specialty/work
Physiotherapy
Street address
Faculty of Rehabilitation Sciences, Iran University of Medical Sciences, Shah Nazari Street, Mirdamad, Madar Square, Tehran, Iran
City
Tehran
Province
Tehran
Postal code
1545913487
Phone
+98 21 2222 2059
Fax
Email
pbehresi@gmail.com

Person responsible for updating data

Contact
Name of organization / entity
Iran University of Medical Sciences
Full name of responsible person
Parnian Mirbehresi
Position
PhD Candidate
Latest degree
Master
Other areas of specialty/work
Physiotherapy
Street address
Faculty of Rehabilitation Sciences, Iran University of Medical Sciences, Shah Nazari Street, Mirdamad, Madar Square, Tehran, Iran
City
Tehran
Province
Tehran
Postal code
1545913487
Phone
+98 21 2222 2059
Fax
Email
pbehresi@gmail.com

Sharing plan

Deidentified Individual Participant Data Set (IPD)
Undecided - It is not yet known if there will be a plan to make this available
Study Protocol
Undecided - It is not yet known if there will be a plan to make this available
Statistical Analysis Plan
Undecided - It is not yet known if there will be a plan to make this available
Informed Consent Form
Undecided - It is not yet known if there will be a plan to make this available
Clinical Study Report
Undecided - It is not yet known if there will be a plan to make this available
Analytic Code
Undecided - It is not yet known if there will be a plan to

make this available	
Data Dictionary	Undecided - It is not yet known if there will be a plan to make this available