**Date:** 25/01/2022

**Official Title:** The Effect of Different Neuromodulation Techniques in the Treatment of Multiple Sclerosis Patients With Neurogenic Bladder Dysfunction

**Study Protocol**

Inclusion criteria for the study;

- 18-65 years old
- Woman
- Volunteer to participate in the study
- Neurogenic overactive bladder due to MS
- EDSS <7.0
- Not benefiting from pharmacological treatment

Exclusion criteria from the study;

- With urinary tract infection
- Diagnosed with diabetes mellitus
- Using diuretic medication
- Using clean intermittent catheterization
- Having a history of different urological diseases
- Those who have conditions that would be contraindicated for electrical stimulation (pacemaker, brain pacemaker, prosthesis)

Evaluation methods;

- Demographic information form
- Extended disability status scale (EDSS)
- Overactive bladder questionnaire (OAB-V8)
- Incontinence severity index (ISI)
- Incontinence quality of life scale (I-QOL)
- Voiding diary
- Urodynamics

According to the treatment protocols of the patients to be included in the study; will be divided into 2 groups as transcutaneous posterior tibial nerve stimulation group (8 patients) and repetitive transcranial magnetic stimulation group (8 patients). Which method will be applied to which individual will be determined randomly. Treatment sessions will be carried out for 5 consecutive days in 2 consecutive weeks, 1 time per day for a total of 10 sessions. The urological parameters of the patients in all groups will be evaluated before and after the treatment.

Transcutaneous Posterior Tibial Nerve Stimulation Group

The treatment will be carried out by the physiotherapist using the Tenstem Eco Basic device. The treatment parameters will be applied with a pulse current time of 200 μsec, a fixed frequency of 10 Hz, a treatment time of 20 minutes, and a current intensity that the patient can tolerate, which will not cause flexion in the big toe or fan movement in the other fingers. Self-adhesive surface electrodes will be used for stimulation. During the treatment, the patient will lie on his back. The negative electrode will be placed 2 cm posterior to the medial malleolus and the positive electrode will be placed 10 cm proximal.

Repetitive Transcranial Magnetic Stimulation Group

The treatment will be applied with a Power Mag device. The treatment will be internally cooled 70 mm double coil and 110 mm round coil, accompanied by a physiotherapist and neurologist. The coil will be placed on the precentral gyrus. Practices will be held, with each session lasting 20 minutes. Cortical excitability will be provided by high frequency (HF) stimulation (5-Hz).