

INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Efficacy of Sacral Magnetic Stimulation on Neurogenic Bladder after Spinal Cord Injury: A Meta-analysis

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Review question / Objective: P (Population): patients with neurogenic bladder (NB) after spinal cord injury; I (Intervention): sacral magnetic stimulation and routine rehabilitation training; C (Comparison): routine rehabilitation training and/or sham-sacral magnetic stimulation; O (Outcome): urinary frequency, voided volume, maximum urination volume, first sensation capacity, maximum bladder volume, maximum bladder pressure, QOL (Quality of Life Score), VAS(Visual Analogue Scale), LUTS (Lower Urinary Tract Symptoms); S (Study): Randomized controlled trial, RCT. **Condition being studied:** Spinal cord injury (SCI) leads to long-term disabilities with significant social and economic consequences. After SCI, bladder dysfunction is common and improved bladder function consistently ranks as the top quality of life priority in individuals with SCI. Patients with a neurogenic bladder following SCI often catheterize themselves to empty the bladder, and urinary tract infections and obstructive uropathies are common.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 02 June 2022 and was last updated on 02 June 2022 (registration number INPLASY202260009).

INTRODUCTION

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METHODS

Search strategy: The databases searched included CNKI, SinoMed, Wanfang Database, VIP, PubMed, MEDLINE, Web of Science, Embase, Cochrane Library and Physiotherapy Evidence Database (PEDro). According to the combination of subject words and free words, the search terms are as follows: spinal cord injury, SCI, spinal cord trauma, traumatic myelopathy, neurogenic bladder, NB, neurogenic urinary bladder, neurogenic overactive bladder, NOAB, neurogenic bladder dysfunction, neurogenic detrusor overactivity, NDO, lower urinary tract dysfunction, detrusor overactivity, urinary retention, urinary incontinence, sacral nerve root, sacral nerve, sacral magnetic stimulation, SMS, functional magnetic stimulation, FMS, magnetic stimulation, transcranial magnetic stimulation, TMS, repetitive transcranial magnetic stimulation, rTMS, magnetic field therapy. PubMed:((((("spinal cord injuries"[Mesh]) OR (SCI)) OR (spinal cord trauma) AND (clinicaltrial[Filter] OR randomizedcontrolledtrial[Filter])) AND (((((((((((("urinary bladder, neurogenic"[Mesh]) OR ("urinary bladder, overactive"[Mesh])) OR (NOAB)) OR (neurogenic bladder)) OR (NB)) OR (neurogenic bladder dysfunction)) OR

(neurogenic detrusor overactivity)) OR (NDO)) OR (lower urinary tract dysfunction)) OR (detrusor overactivity)) OR (urinary retention)) OR (urinary incontinence) AND (clinicaltrial[Filter] OR randomizedcontrolledtrial[Filter])) AND (((sacral magnetic stimulation) OR (SMS) AND (clinicaltrial[Filter] OR randomizedcontrolledtrial[Filter])) OR (((sacral nerve root) OR (sacral nerve) AND (clinicaltrial[Filter] OR randomizedcontrolledtrial[Filter])) AND (((((((("magnetic field therapy"[Mesh]) OR ("transcranial magnetic stimulation"[Mesh])) OR (TMS)) OR (functional magnetic stimulation)) OR (FMS)) OR (magnetic stimulation)) OR (repetitive transcranial magnetic stimulation)) OR (rTMS) AND (clinicaltrial[Filter] OR randomizedcontrolledtrial[Filter])) AND (clinicaltrial[Filter] OR randomizedcontrolledtrial[Filter])) AND (clinicaltrial[Filter] OR randomizedcontrolledtrial[Filter])) OR randomizedcontrolledtrial[Filter])).

Participant or population: The patients met the diagnostic criteria of Spinal cord Injury formulated by American Spinal Injury Association (ASIA) and had a clear diagnosis of SCI by CT combined with urodynamic study.

Intervention: Sacral magnetic stimulation combined with routine rehabilitation training.

Comparator: Routine rehabilitation training.

Study designs to be included: Randomized controlled trial of SMS in the treatment of neurogenic bladder after spinal cord injury.

Eligibility criteria: Inclusion criteria: The patients met the diagnostic criteria of Spinal cord Injury formulated by American Spinal Injury Association (ASIA) and had finished the Spinal shock stage; There is at least one neurogenic bladder such as urinary retention and urinary incontinence; The indwelling catheter has been removed. Exclusion criteria: Cohort studies, cross-sectional studies and other non-RCTs; Non-Chinese and English literature;

Unable to obtain the full text or incomplete data; Case reports and animal experiments; Repeated publication and review articles, etc.

Information sources: Randomized controlled trials (RCTs) about sacral magnetic stimulation on neurogenic bladder after spinal cord injury were searched from CNKI, SinoMed, Wanfang Database, VIP, PubMed, MEDLINE, Web of Science, Embase, Cochrane Library and Physiotherapy Evidence Database (PEDro), from inception to May, 2022. In addition, secondary search will be conducted on the reference list of included articles to identify other possible relevant studies.

Main outcome(s): Before and after treatment, a dedicated person uses voiding diary and urodynamic study to assess the recovery of bladder function. Including urinary frequency, voided volume, maximum urination volume, first sensation capacity, maximum bladder volume, maximum bladder pressure, ect.

Additional outcome(s): Pain scores and quality of life were assessed before and after treatment, such as QOL, VAS, LUTS.

Data management: Two researchers independently extracted data, including urinary frequency, voided volume, maximum urination volume, first sensation capacity, maximum bladder volume, maximum bladder pressure, QOL, VAS, LUTS.

Quality assessment / Risk of bias analysis: The Cochrane Manual 5.1 standards were used to evaluate the risk of bias in the literature, and a "risk of bias assessment" form was developed. It mainly includes 6 aspects: random allocation method; allocation plan concealment; blinding method for research objects, intervention implementers and research results evaluators; completeness of outcome

data; selective reporting of research results; other sources of bias.

Strategy of data synthesis: Meta analysis using RevMan5.4 software, since all included outcome indicators were continuous variables, mean differences (MD) and 95% confidence interval (CI) were used to represent them.

Subgroup analysis: Perform subgroup analysis according to disease course, intervention period and the type of NB.

Sensitivity analysis: Sensitivity analysis was performed by sequential deletion tests to test the stability of the main results. That is, after the deletion of any one study, the combined results of the remaining literature are not significantly different from those that would have passed the sensitivity analysis if it had not been deleted.

Language: The full text of the literature is required to be in Chinese or English.

Country(ies) involved: China.

Keywords: spinal cord injury; neurogenic bladder; sacral magnetic stimulation; meta-analysis.

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