

INPLASY PROTOCOL

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Review Stage at time of this submission: The review has not yet started.

Conflicts of interest:

None.

Do external supports influence proprioception in patients with chronic ankle instability ? A systematic review with meta-analyses

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Review question / Objective: Do external supports influence proprioception (Kinesthesia and Joint position sense) in patients with chronic ankle instability?

Condition being studied: Reason can be the sensorimotor deficits, including impaired force sense.

Information sources: Seven electronic database, including Embase, Web of Science, SPORTDiscus, PubMed, Scopus, CINAHL and Cochrane Library. The reference lists of each included paper were also checked manually.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 05 September 2020 and was last updated on 05 September 2020 (registration number INPLASY202090020).

INTRODUCTION

Review question / Objective: Do external supports influence proprioception (Kinesthesia and Joint position sense) in patients with chronic ankle instability?

Rationale: The results of studies on the effect of external support on proprioception in CAI patients were in conflicts.

Condition being studied: Reason can be the sensorimotor deficits, including impaired force sense.

METHODS

Search strategy: Lateral Ankle sprain (LAS) is one of the most common sport-related lower extremity musculoskeletal injury. Over 2 million ankle sprains are treated in emergency departments in the US and UK each year, resulting in about \$2 billion of healthcare costs. In long-term prognosis, more than 30 % of patients reporting repetitive bouts of ankle giving way and recurring sprains, termed as chronic ankle instability (CAI). For the patients suffering from persistent symptoms, surgery is usually suggested and most of them can obtain good outcomes, while some still end up poorly and fail to return to sport. One possible can be the sensorimotor deficits.

Participant or population: Individuals with chronic ankle instability.

Intervention: Ankle External supports. (e.g. taping, bracing).

Comparator: Ankles without external supports.

Study designs to be included: Crossover or RCT studies.

Eligibility criteria: Peer-reviewed human studies in English that investigated the effect of external supports (taping, bracing) on joint proprioception (JPS and kinesthesia) in the injured ankle of individuals with a history of ankle sprain.

Information sources: Seven electronic database, including Embase, Web of Science, SPORTDiscus, PubMed, Scopus, CINAHL and Cochrane Library. The reference lists of each included paper were also checked manually.

Main outcome(s): The proprioception scores of the injured ankles with/without external supports.

Additional outcome(s): None.

Data management: Studies were reviewed independently by two authors (XX, ZC). If disagreements couldn't be resolved

through discussion, the third reviewer (YH) was consulted. Then, the same procedure was applied to extract following information: demographic data, sample size, details of test methodology (movement direction, target angle, angular velocity), joint proprioception results (means and standard deviation), and summarized results. The authors were contacted if numerical data were confusing or not reported.

Quality assessment / Risk of bias analysis: All the authors discussed the standard of each item before formal rating, and two authors (XX, ZC) rated the included studies independently. The inter-rater agreements of the initial ratings were calculated, and the third reviewer (YH) be consulted for disagreements. To assess the quality of studies, the Methodological index for non-randomized studies (MINORS) was applied, which included 8 items for non-randomized non-comparative studies. Each item was scored as 'reported and adequate' (2 point), 'reported but inadequate' (1 points), 'not reported' (0 points). An overall score was calculated as the quality of studies. To assess the variability of CAI patients, the recommendation of the International Ankle Consortium was applied. The standard CAI criteria included: (1) At least 1 significant ankle sprain that occurred at least 12 months ago and resulted in pain, swelling and at least 1 interrupted day of desired physical activity; (2) Do not have any ankle injury in the past 3 months; (3) Have at least 1 of the classical symptoms.

Strategy of data synthesis: A meta-analysis of the random-effects model was performed by Stata V.14 (Stata Corp LP, College Station, TX, USA) for the studies similar in proprioception type and movement direction. Standardized mean difference (SMD) was calculated for all data between CAI patients and controls with 95% confidence intervals (CI). Higher SMD represented larger joint proprioception deficits in CAI, with 0.2~0.5 as weak, 0.5~0.8 as moderate, >0.8 as large-sized effect. To evaluate heterogeneity, Q and I² statistics were calculated, with p<0.05 as statistically significant and I² values ≥75%

as high heterogeneity. No analysis was conducted for publication bias due to the small number of studies included in this review.

Subgroup analysis: Movement directions.

Sensibility analysis: Sensitivity analysis would be conducted through removing single study at a time and then evaluating the pooled results again.

Language: English.

Country(ies) involved: China.

Other relevant information: None.

Keywords: External supports, Proprioception, Ankle instability.

Dissemination plans: Published in SCI journals.

Contributions of each author:

Author 1 - Xiao'ao Xue - Study design; literature search and selection; data collection; quality rating; statistical analysis; writing of the manuscript.

Author 2 - Ziyi Chen - Study design; literature search and selection; data collection; quality rating; reviewing of the manuscript.

Author 3 - Tengjia Ma - Study design; reviewing the manuscript.

Author 4 - Qianru Li - Study design; reviewing the manuscript.

Author 5 - Xiaoyun Xu - Study design; reviewing the manuscript.

Author 6 - Yinghui Hua - Study design; supervision of literature search, data collection and quality rating; reviewing the manuscript.