Treatment of Medial Tibial Stress Syndrome: A Critical Review

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Reference

Winters M, Eskes M, Weir A, Moen M, Backx F, Bakker E. Treatment of Medial Tibial Stress Syndrome: a systematic review. *Sports Med*. 2013;43(12):1315-1333. PubMed doi:10.1007/s40279-013-0087-0

Clinical Question

Among collegiate athletes, what are effective interventions for the treatment of medial tibial stress syndrome (MTSS) in reducing perceptions of pain?

Data Sources

Electronic databases (MEDLINE, CENTRAL, EMBASE, CINAHL, PEDro and SPORTDiscus) and trial registries were searched utilizing the search terms: "medial tibial stress syndrome"; "tibial stress syndrome"; medial tibial syndrome"; "shin splints syndrome"; "shin splint"; "shin splints"; "shin soreness." The search strategy the authors used for MEDLINE was: "Medial Tibial Stress Syndrome"[Mesh] OR Tibial Stress Syndrome*[tiab] OR shin splint*[tiab] OR shin soreness*[tiab] OR tibial Stress injury* [tiab] OR shinsplint*[tiab] OR shin splint syndrome* [tiab] OR medial tibial syndrome* [tiab]. Dates were searched from the article's inception to June 1, 2012. Gray literature was searched for additional relevant reports.

Study Selection

After removal of duplicates, two reviewers independently screened titles and abstracts of all papers identified in their search. In any case of initial disagreement, the two reviewers reached consensus on inclusion of the trial. Published or unpublished studies that reported randomized or nonrandomized controlled trials of any intervention compared with another treatment, or no treatment, in subjects that had MTSS were eligible for inclusion in the study.

Data Extraction

The Cochrane Risk of Bias Tool was used to appraise randomized control trial (RCT) study quality, and the Newcastle Ottawa Scale was used for nonrandomized trials; level of evidence was then assigned according to the Oxford Centre for Evidence-Based Medicine. Two reviewers independently searched for articles, reviewed all articles, extracted data, and assessed methodological quality. Study design, subjects, intervention being studied, outcome parameters, and results were recorded on standardized data extraction forms. Interventions were assessed for effectiveness on time to recovery, global perceived effect, and/or perception of pain.

Main Results

The authors initial search yielded 772 reports; however, only 11 studies met the inclusion criteria and were included in the systematic review. The studies that met the inclusion criteria examined the effect of conservative treatment of MTSS; no studies examined the effects of surgical interventions. All RCTs revealed a high risk of bias, and therefore graded as Level 3 evidence. Quality assessment of the two nonrandomized

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clinical trials determined a grade Level 4 evidence. Fixed effect models were used to estimate the effect of lower leg braces versus no braces, and iontophoresis versus phonophoresis; no significant difference for either lower leg braces (standardized mean difference [SMD] −0.06%; 95% CI −0.44–0.32, $p = .76$) or iontophoresis (SMD 0.09; 95% CI −0.50–0.68, $p = .76$) was found. Iontophoresis, phonophoresis, ice massage, ultrasound therapy, periosteal pecking, and extracorporeal shockwave therapy (ESWT) have been suggested to be effective in treating MTSS (Level 3–4 evidence). Low-energy laser treatment, stretching and strengthening exercises, sports compression stockings, lower leg braces, and pulsed electromagnetic fields show no effectiveness in treating MTSS (Level 3 evidence).

Commentary

Medial tibial stress syndrome (MTSS) is a common overuse injury seen by athletic trainers (ATs) across a variety of sports and competition levels. Among military personnel, runners, and dancers the incidence of MTSS is estimated to be between 4%–35%, with the highest prevalence noted in distance runners.[1,2] MTSS is commonly defined as pain along the posteromedial (PM) border during exercise or pain with palpation over a 5 cm or greater area of the PM border of the tibia.[3] Over the past few years, several conservative and surgical interventions have been considered for the treatment of MTSS, including graded running programs,[4,5] various exercise programs,[4,5] shockwave therapy,[6] and fasciotomy.[5] However, the effectiveness of these various interventions in treating MTSS still remains unclear. Winters et al.[7] reviewed the current literature to determine the effectiveness for interventions in the treatment of MTSS.

Winters et al.[7] included 11 articles for analysis in the systematic review. All nine RCTs were of poor quality (Level 3 evidence), primarily due to the inability to blind participants and clinicians to the intervention being investigated. The other two studies, both nonrandomized clinical trials, were assessed and also found to be of poor quality (Level 4 evidence). All interventions were identified and assessed for three primary outcomes: time to recovery, global perceived effect, and pain.

Since ATs work with numerous patient populations, clinicians should consider the various population type and demographics when reviewing these results. The studies reviewed by Winters et al.[7] included military populations, athletic populations, and one unspecified population. Clinicians should be cautious of the findings from this systematic review as the generalizability of results from these investigations beyond the included populations is unknown. Different treatment parameters may also be warranted, so clinicians should use caution when interpreting or applying these results. A more detailed description of each intervention and results is displayed in Table 1. Of all the studies included for analysis in the systematic review, no evidence for any of the included interventions was found to have a significant effect in treating MTSS.

Table 1. Summary of Studies Included in the Systematic Review

Author	Population	Study Design	Intervention	Results
Smith et al., 1986[12]	Military population	RCT	Group 1: Iontophoresis Group 2: Ice massage Group 3: Phonophoresis Group 4: Ultrasound therapy Group 5: Control All treatments were compared individually to the control. Every group received heel stretching exercises and were placed on limited duty.	No treatment was found superior over another treatment; subjects in the four treatment groups significantly decreased their perceived pain level over the control group.
Singh et al., 2002[13]	Unspecified population	RCT	Iontophoresis versus phonophoresis	Iontophoresis was not found to be a superior treatment to phonophoresis.