International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

The use of extracorporeal shockwave therapies for in-season athletes and physically active individuals: a systematic review

INPLASY2023110075
doi: 10.37766/inplasy2023.11.0075
Received: 19 November 2023
Published: 19 November 2023

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2023110075

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on19 November 2023 and was last updated on 19 November 2023.

INTRODUCTION

Review question / Objective The purpose of this review is to evaluate the current research investigating the use of extracorporeal shockwave therapy (ESWT) for in-season athletes and physically active individuals.
Population: in-season athletes, physically active individuals (or occupational groups)
Intervention: ESWT (radial, focused, or both)
Comparator: (for randomized controlled trials and comparative studies) sham/placebo or other treatments
Outcomes: patient reported outcome measures such as pain score, functional outcome measures, return to activities or sports.

Rationale For in-season athletes, there is a need for an effective and safe treatments that may allow continued participation in training and competition. ESWT has been shown effective in diverse sports-related injuries, especially in plantar fasciitis and Achilles tendinopathy. However, there is no review to date that has summarized available evidence of ESWT for in-season athletes and physically active individuals.

Condition being studied Patellar tendinopathy, plantar fasciitis, medial tibial stress syndrome, hamstring tendinopathy, Achilles tendinopathy, lateral epicondylitis, rotator cuff injuries, distal biceps tendinopathy, IT band syndrome, tibial posterior tendinopathy, bone-related injuries, myositis ossificans, muscle injuries.

METHODS

Search strategy A librarian affiliated to our institution designed a search strategy and conducted searches in four databases, PubMed (NLM), Embase (Elsevier), CINAHL complete (EBSCO), and Web of Science (Clarivate) on April 21, 2023 and deduplicated using EndNote. Covidence was used to upload retrieved records from each database and screen eligible studies.

Participant or population In-season athletes, physically active individuals/occupational groups.

Intervention ESWT (radial, focused, or combined).

Comparator For randomized controlled trials and comparative studies, comparators will include sham/placebo or other treatments including (not limited to) surgery, platelet-rich plasma, or corticosteroid injections. There will be no comparator in case series or case reports.

Study designs to be included Randomized controlled trials (RCTs), cohort studies, case-control studies, cases series, and case reports.

Eligibility criteria Studies with outcomes following ESWT for in-season athletes, physically active individuals, and occupational groups. In studies that mentioned the proportion of athletes or physically active individuals, those with greater than 80% of such populations were eligible for inclusion.

Information sources PubMed (NLM), Embase (Elsevier), CINAHL complete (EBSCO), and Web of Science (Clarivate).

Main outcome(s) patient reported outcome measures such as pain score, functional outcome measures, return to activities or sports, activity restriction following ESWT, and adverse events.

Data management Two authors independently performed data extraction. The following information were extracted in a template: authors, year of publication, origin, study design, patient demographics, symptom duration, conditions, ESWT characteristics, activity restriction following ESWT, comparators, outcome measures, follow-up duration, main findings including return to sports/ activities, and complications.

Quality assessment / Risk of bias analysis For RCT, revised Cochrane risk-of-bias- tool (ROB2) will be used. For non-randomized comparative studies, Risk of Bias in Non-randomised Studies of Intervention (ROBINS-I) will be used. For case series and case reports, Joanna Briggs Institute (JBI) Critical Appraisal Checklist will be used. Two authors will independently evaluate the risk of bias for included studies.

Strategy of data synthesis Meta-analyses will be performed when two or more studies were considered homogeneous (i.e., similar comparators, same outcome measures, and follow-up periods within the range of two weeks) within each pathology. A random-effects pairwise meta-analyses will be performed to account for variability across the studies. The standardized mean difference (SMD) between ESWT and comparators will be used as a measure of effect size in patient reported outcomes given better interpretability. An SMD of 0.2 indicates a small effect size, 0.5 indicates a medium effect size, and 0.8 or larger indicates a large effect size. For other studies, qualitative analysis will be performed using the data extracted above.

Subgroup analysis Within each pathology, if there are two or more studies with patients from the same sports, subgroup analyses will be performed by sports.

Sensitivity analysis Within each pathology, if there are two or more RCTs, meta-analyses only including RCTs will be performed for sensitivity analysis.

Language restriction We will limit the studies to those published in English language based on the previous studies suggesting no evidence of bias when studies in other languages were excluded.

Country(ies) involved United States.

Other relevant information Initially, the protocol for this review was prospectively registered as scoping review (INPLASY 202340102). However, reflecting on reviewers' comments and following their suggestions during a peer-reviewed process, we converted it to systematic review. Plans for risk of bias assessment and data analysis formulated above are set a priori (i.e., at the time of drafting this protocol, risk of bias assessment and data analysis are not performed yet).

Keywords Extracorporeal shockwave therapy; in-season athletes; return to play; systematic review.

Dissemination plans Publication in peer-reviewed journal.

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