International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Risk factors of chronic ankle instability after ankle sprain: a systematic review and meta-analysis

INPLASY202530035
doi: 10.37766/inplasy2025.3.0035
Received: 9 March 2025
Published: 9 March 2025

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ADMINISTRATIVE INFORMATION

Support - This work was supported by the National Natural Science Foundation of China [no. 82372492].

Review Stage at time of this submission - Piloting of the study selection process.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202530035

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 9 March 2025 and was last updated on 9 March 2025.

INTRODUCTION

Review question / Objective The objective of this systematic review and meta-analysis is to find out the risk factors contributing to chronic ankle instability(CAI) after a lateral ankle sprain(LAS) through comparing those who become copers after LAS with those who develop CAI. And the review focuses on prospective cohort studies.

Condition being studied Ankle sprain is one of the most common injuries in competitive or recreational sports and it can easily develop to chronic ankle instability(CAI), which causes considerable burden on health conditions and economic sectors. Symptoms of CAI include feelings of instability, functional deficits, recurrence of sprains and so on. So it indicates that knowledge of factors that contribute to CAI and its development is very crucial.

METHODS

Search strategy (((risk*[Title/Abstract] OR factor*[Title/Abstract] OR influenc*[Title/Abstract] OR predict*[Title/Abstract] OR incidence*[Title/Abstract] OR prevention*[Title/Abstract]) AND (prospective[Title/Abstract] OR cohort[Title/Abstract] OR longitudinal[Title/Abstract])) AND (ankle*[Title/Abstract] OR "lateral ligament"[Title/Abstract] OR "lateral ligaments"[Title/Abstract])) AND (sprain*[Title/Abstract] OR inversion*[Title/Abstract] OR instab*[Title/Abstract] OR injur*[Title/Abstract] OR reinjur*[Title/Abstract] OR recurrence*[Title/Abstract] OR lesion*[Title/Abstract] OR unstable[Title/Abstract] OR strain*[Title/Abstract] OR rupture*[Title/Abstract] OR tear*[Title/Abstract]).

Participant or population Chronic ankle instability is defined as a multifaceted condition that may present as either mechanical instability of lateral

ligaments, perceived instability, recurrent ankle sprains or a combination of these factors. The targeted population of this review is those who develop CAI after an ankle sprain and those who become copers(a healthy condition) after an ankle sprain.

Intervention None.

Comparator None. This is an observational study, and it focuses on the influencing factors during the process from initial ankle sprain to chronic ankle instability.

Study designs to be included prospective cohort study.

Eligibility criteria (1) longitudinal design, (2) follow-up length of at least three months since the sprain, (3) participants of any age who had sustained ankle sprain, (4) measuring at least one of the potential predictors of CAI, (5) reporting on any re-sprain or residual symptoms after the initial ankle sprain during the follow up period, (6) published full paper and in English.

Information sources MEDLINE, CINAHL, ScienceDirect, SPORTDiscus, PubMed, Scopus, Web of Science.

Main outcome(s) Whether these potential risk factors make patients with ankle sprain develop to CAI.

Quality assessment / Risk of bias analysis Newcastle-Ottawa Scale(NOS).

Strategy of data synthesis Data were entered into the RevMan software program (V.5.3; Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014). For dichotomous variables, odds ratios (OR) and 95% confidence intervals were calculated, and for continuous variables, the standardised mean difference (SMD) and 95% confidence intervals were calculated. To enable comparisons across dichotomous and continuous variables, ORs were converted to effect sizes. Effect sizes were calculated for all significant comparisons and were interpreted using the following cut-offs: < 0.15 = negligible, ≥0.15 to < 0.40 = small, ≥0.40 to < 0.75 = medium, ≥0.75 to < 1.10 = large, ≥1.10 = very large. Where possible, meta-analysis was performed using the random effects model. Heterogeneity was calculated using the $\chi 2$ and I2 statistics.

Subgroup analysis Based on the definition of CAI, the subgroups can be divided into re-sprain group, perceived instability group, episodes of giving way group and so on. The grouping strategy has not been determined and can be changed when analyzing the associated data.

Sensitivity analysis Sensitivity analyses were performed by reevaluating pooled results after the removal of studies with large effects.

Language restriction English.

Country(ies) involved China.

Keywords chronic ankle instability, lateral ankle sprain, risk factors.

Contributions of each author

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