# INPLASY PROTOCOL

**Corresponding author:**
**Yi Cui**

cuiyi1103@sina.com

**Author Affiliation:**
**Department of Orthopaedic Surgery, 920th Hospital of Joint Logistics Support Force.**

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# Incidence of lumbar spondylolysis in athletes with low back pain: a systematic evaluation and single-arm Meta-analysis

Li, J[1]; Xu, Y[2]; Feng, F[3]; Du, D[4]; Shen, J[5]; Liang, J[6]; Cui, Y[7].

**Review question / Objective:** Low back pain (LBP) is a common complaint among athletes seeking medical attention. Lumbar spondylolysis (LS) is a frequent cause of LBP in young athletes. In the adult population, the prevalence is about 5% and the prevalence of LBP has been reported to be much higher in athletes than in non-athletes. The purpose of this meta-analysis was to examine the incidence of lumbar isthmic fractures in athletes withLBP.

**Eligibility criteria:** Inclusion criteria: (1) the study population was athletes who had a history of lower back pain; and (2) the outcome indicators included the incidence of lumbar isthmic fractures. Exclusion criteria: (1) reviews, case series involving fewer than 10 patients, case controls, etc.; (2) study population discrepancy or small sample size is a sample size less than 30; (3) disease discrepancy (4) outcome indicators discrepancy.

## INTRODUCTION

**Review question / Objective:** Low back pain (LBP) is a common complaint among athletes seeking medical attention. Lumbar spondylolysis (LS) is a frequent cause of LBP in young athletes. In the adult population, the prevalence is about 5% and the prevalence of LBP has been reported to be much higher in athletes than in non-athletes. The purpose of this meta-analysis was to examine the incidence of lumbar isthmic fractures in athletes withLBP.

**Condition being studied:** Sportsman in disease.

## METHODS

**Participant or population:** Sportsman with low back pain.

**Intervention:** Nothing.

**Comparator:** Nothing.

**Study designs to be included:** Case series and Retrospective case review and Cohort study.

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**Information sources:** PubMed, Embase, Cochrane, and WOS (Web ofScience) database.

**Main outcome(s):** A total of 9 studies (835 patients) were included in this study. Meta-analysis revealed that the prevalence of LS in athletes with LBP was estimated at 41.7%, [95% CI = (0.28 to 0.55)], but this prevalence varied considerably with the gender and age of the athletes.

**Quality assessment / Risk of bias analysis:** Two independent risk of bias assessments were performed using the MINORS scale (methodological index for non-randomized-studies) [8] for the inclusion of non-randomized controlled interventional studies. The assessment consisted of 12 evaluation indicators, each scored 0-2, the first 8 for studies without a control group, with a maximum score of 16; the last 4 together with the first 8 for studies with a control group, with a total maximum score of 24. A score of 0 indicates that it was not reported; a score of 1 indicates that it was reported but with insufficient information; and a score of 2 indicates that it was reported and sufficient information was provided. Two researchers cross-checked after the assessment was completed, and if there was disagreement, a third researcher assisted in the ruling.

**Strategy of data synthesis:** R4.04 software (R Development Core Team, Vienna, http://www.R-project.org) was used to perform the single-arm Meta-analysis, in which the metafor package, the matrix package and the meta package were used. Heterogeneity was quantified statistically by Cochran's Q test and Higgins I2. The different cutoff intervals of I2 values from 0 to 25%, 26% to 50%, 51% to 75% and 76% to 100% correspond to no significant, moderate, significant and very strong heterogeneity, respectively. When I2 < 50% then the fixed effects model was used to combine the effect sizes. When I2 > 50%, effect sizes were combined using a random-effects model, and sources of heterogeneity were explored using subgroup and sensitivity analyses. Funnel plots were used to visualize publication bias, and statistical tests were performed using Egger's test and begg's test. The difference was statistically significant at $P < 0.05$.

**Subgroup analysis:** Because of the differences among studies in terms of athlete gender, sources of heterogeneity are discussed by subgroups of gender. The results showed low heterogeneity in the male athlete group when grouped by mixed and single male athletes, while high heterogeneity remained in the mixed group (Figure 3). Thus, gender may be a source of heterogeneity.
Also, we performed Meta-regression based on the mean age of the patients, and the results showed significant heterogeneity in the incidence of lumbar fissure between ages ($P_{Age} = 0.044$) we performed Meta-regression based on the mean age of the patients, and the results showed significant heterogeneity in the incidence of lumbar fissure between ages ($P_{Age} = 0.044$) (Figure 4).
Sensitivity analysis showed that the studies included in the analysis were stable, with no significant change in effect size after excluding each study separately.

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**Country(ies) involved:** China.

**Keywords:** lumbar isthmic fracture; retrospective analysis; prevalence; adolescent.

**Contributions of each author:**
Author 1 - Li J.
Author 2 - Xu Y.
Author 3 - Feng F.
Author 4 - Du D.
Author 5 - Shen J.
Author 6 - Liang J.
Author 7 - Cui Y.