Factors that differentiate athletes with and without hip and groin pain -

a systematic review

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Review question(s)

The aim of this study is to conduct a systematic review and, if valid, a meta-analysis of the literature regarding the factors that differentiate athletes with and without hip and groin pain in athletic populations.

Searches

A comprehensive, systematic literature search will be conducted using the following electronic databases with no date restrictions: i) Embase.com ii) Medline (OvidSP) iii) Cochrane iv) Web-of-science v) Scopus vi) Cinahl vii) PubMed publisher and viii) Google Scholar. The following key words will be used for the search in differing combinations; 'hip', 'inguinal', 'groin', 'pubalgia', 'pain', 'sport', 'team sport', 'sport injury', 'sports medicine', 'athlete', 'athletic performance' plus various key sports in which a known high incidence of hip and groin pain is observed. The search will be limited to articles written in English, Dutch, German, Italian, French and Spanish languages and will only include human studies.

Original published studies (full text) that are identified by the search strategy will be examined against the inclusion criteria. Reference lists of all publications considered for inclusion will be thoroughly hand-searched to identify further relevant publications. All potential references will be imported into Endnote X4 (Thomson Reuters, Carlsbad,
California, USA) and duplicates will be removed. Search strategies will be adapted as required for each specific database.

**Link to search strategy**

**Condition or domain being studied**

Hip and groin pain is commonly experienced by athletes, particularly those participating in sports involving cutting and kicking movements such as the various football codes and ice hockey [1,2]. This sporting injury can create high morbidity for these athletes in terms of time lost from their sport, a high risk of recurrence and a protracted rehabilitation time [3–6]. To our knowledge, there are no published systematic reviews investigating the factors associated with hip and/or groin pain in athletes. The identification of such factors, which could potentially be modifiable, may assist in directing management and injury prevention strategies for this injury. This paper will utilize a systematic search strategy to identify the factors associated with hip and groin pain in athletic populations and will consider the methodological quality of the included studies when interpreting study outcomes through a standardised critical appraisal reviewing method.

**Participants/population**

Studies including athletic populations who have reported experiencing hip and/or groin pain. Hip and groin pain will be defined as any pain deep in the hip joint or surrounding soft tissues or at the junction between the anteromedial part of the thigh, including the proximal part of the adductor muscle bellies, and the lower abdomen[6]. Athletic will be defined as regular participation in any of the sports included under the MESH term “sports” plus
marathon running. Only studies containing greater than or equal to 10 participants will be included. No restrictions will be placed on the duration of participant symptoms.

**Intervention(s), exposure(s)**

Observational studies of athletic populations with hip and groin pain will be included.

**Comparator(s)/control**

Studies using healthy, matched controls (between-subject control) will be included.

**Types of study to be included**

We will include case-control, cohort, or cross-sectional studies. Studies written in English, Dutch, German, Italian, French or Spanish will be included. Studies examining at least one possible factor associated with hip and groin pain in these populations will be included in the review. Case series and opinion pieces will be excluded from the review.

**Context**

There will be no restrictions placed on recruitment method or setting.

**Outcome(s)**

*Primary outcome measure:* Identification of factors that differentiate athletes with and without hip and groin pain.

**Data extraction, (selection and coding)**

The results of the database searches will be imported into Endnote X4 reference-handling system and screened for eligibility by two independent reviewers (ABM, RA). Any
discrepancies in eligibility of studies to be included in the quality assessment will be discussed to reach consensus, with unresolved cases taken to a third reviewer (KMC). Two reviewers (ABM, RA) will then independently extract data from the studies, using a predefined spreadsheet.

The data to be extracted will include:

i. Study characteristics including population size and location, and source of funding;
ii. Characteristics of the study population including age and sporting activity
iii. Characteristics of the hip and groin pain experienced by the participants
iv. The factors that differentiated the participants with groin pain from those without
v. Risk of bias

If additional data are required, the study authors will be contacted to obtain this data. If data are imputed or calculated from the included studies, this will be reported in a table describing the characteristics of the included studies. Any disagreements will be discussed by consensus and resolved by a third review author (KMC). Extracted data from the studies will be managed and collated by ABM and RA.

The inter-rater reliability between the reviewers of the quality assessment tool will be assessed by calculating the ICC.

**Risk of bias (quality assessment)**

Two reviewers (ABM and RA) will independently conduct methodological quality assessment on each included article using the modified Langham/Downs and Black scale, which is appropriate for evaluating both case-control and cohort studies. Disagreements in initial ratings of methodological quality assessment will be discussed at a consensus meeting (ABM, RA), with a third reviewer involved (KMC) if consensus cannot be reached.

The risk of bias of the included studies will also be assessed according to the recommendations of the PRISMA statement and Cochrane Collaboration using the following
criteria i) potential for selection bias ii) between-group baseline comparability iii) blinding (participants and outcome assessors) iv) other potential confounding factors in the outcome and exposure assessment and the methods used to control for these factors. Each criterion will be assessed for the presence of sufficient information and the likelihood of potential bias and then studies will be rated as ‘Low’, ‘High’ or ‘Unclear’ risk of bias (uncertain of the potential for bias, or insufficient information reported to make an assessment). Disagreements between the review authors (ABM and RA) regarding risk of bias will be discussed at a consensus meeting, with a third reviewer (KMC) involved if consensus cannot be reached.

**Strategy for data synthesis**

Based on methodological quality ratings, a level of evidence will be assigned to each study according to the recommendations proposed by van Tulder et al (2003)[7]. Quantitative findings for each outcome measure will be summarized in tables. Extracted data will be used to calculate effect sizes and 95% confidence intervals for each relevant outcome measure from each study. Statistical heterogeneity for the included studies will be evaluated using the I2 statistic and examination of the forest plots to determine if pooling is appropriate. Data from multiple studies will be pooled where results were reported for the same or comparable outcome measures, and there is similarity in control populations. The magnitude of the pooled result will be interpreted based on Hopkins’ criteria, such that the effect will be considered large if ≥0.8; moderate if 0.5 – 0.8; and weak if 0.2 – 0.5 (13, 14). Sensitivity analysis of the pooled effect size will be conducted by repeating the meta-analyses while omitting each study one by one.

**Analysis of subgroups or subsets**
Narrative synthesis of subgroups (such as; age, sport, diagnosis) will be performed as indicated.

**Type of Review**

Epidemiologic

**Language**

English

**Country**

Qatar, Netherlands, Australia

**Other registration details**

**Dissemination plans**

The review will be submitted for publication in an appropriate peer-reviewed sports medicine journal. The results of this review will also be disseminated to the sports medicine community through conference presentations.

**Keywords**

Hip, groin, pain, pubalgia, athletic, sport, osteitis pubis

**Contact details for further information**

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Details of any existing review of the same topic by the same authors
Not applicable

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Conflicts of interest

The authors have no conflicts of interest to declare.

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References


