Investigation of the pain factors of rotator cuff tears: a protocol for a scoping review

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Abstract

Objective：

The purpose of this scoping review is to investigate factors associated with rotator cuff tear pain and summarize them into incidence, exacerbation, and remission factors.

Introduction：

Rotator cuff tears are one of the most common shoulder disorders. A variety of associated factors have been cited in observational studies, and systematic reviews have examined factors associated with symptomatic rotator cuff tears. However, no reports differentiate pain factors into developmental, exacerbating, and remitting factors.

Inclusion/exclusion criteria：

The study will include patients whose physicians have diagnosed non-traumatic rotator cuff tears using Magnetic Resonance Imaging or ultrasound echo. Outcomes will be a pain, the severity of rotator cuff tear, physical function, and psychological factors. The study design will be observational, with no restrictions on region, race, gender, or language of the original paper.

Methods：

A systematic search of PubMed, Web of Science, CINAHL(EBSCO), PEDro, and Embase (Dialog) databases using the keywords “rotator cuff tear,” “pain,” and “etiology” will be conducted during March 2024. In the first screening step, two independent reviewers will review all of the titles and abstracts to exclude irrelevant articles. In the second screening step, two independent reviewers will review all of the full texts to exclude irrelevant articles. Outcomes will focus on rotator cuff tear severity, pain, physical function, and psychosocial factors, categorizing factors associated with pain according to each study design and identifying incidence factors, exacerbating factors and remission factors.

Introduction

Rotator cuff tears are one of the most common shoulder joint disorders [1)]. Medical costs for arthroscopic rotator cuff repair in the U.S. are estimated to be $1.2-1.6 billion annually, and these cost savings are expected to translate into lower medical costs [2)]. Therefore, conservative treatment is an important stand-in, but it is not even clear why the pain associated with rotator cuff tears occurs.

Cross-sectional studies have reported that the presence of pain and weakness in shoulder abduction and external rotation, impingement sign, and dominant arm are factors associated with symptomatic rotator cuff tears, but not the severity of rotator cuff tears [3-4)]. Prospective

studies examining the developmental factors in patients with asymptomatic rotator cuff tears have identified increased tear size in full-thickness tears [5-7], a transition from partial to full tears [5-7], development of lesions in the long head of the biceps brachii muscle [7], and fatty degenerative [7], as factors in the development of pain. A prospective study investigating pain transitions in symptomatic rotator cuff tears found that enlargement of the rotator cuff tear was not associated with pain intensity [8-9].

Thus, it can be inferred that factors associated with rotator cuff tear pain differ depending on the study design and subject. Therefore, it can be inferred that factors associated with rotator cuff tear pain vary by study design and subject. Therefore, we aimed to summarize factors associated with rotator cuff tear pain by distinguishing between relevant factors from cross-sectional studies and factors associated with pain development, exacerbation, and remission from prospective studies.

Review question

The purpose of this scoping review is to investigate the factors associated with pain in degenerative rotator cuff tears and to summarize development, exacerbation, and remission factors.

Keywords

Pain, Risk factors, Rotator cuff tear, Shoulder, Symptomatic.

Eligibility criteria

Patients will be included in the physician diagnoses of a rotator cuff tear using Magnetic Resonance Imaging or ultrasound echocardiography. Exclusion criteria for the study include those with traumatic episodes, unmeasurable partial or extensive tears, neurological deficits, surgical intervention, and shoulder joint disease other than rotator cuff tears.

Concept

【Patient】

・Degenerative rotator cuff tear (Non-traumatic)

【Exposure】

・Conservative therapy, rehabilitation, physical therapy, drug therapy, injection therapy

【Outcome】

・Does not select specific evaluation items but uses terms for relevant factors

【Study design】

・Observational studies: cross-sectional studies, prospective cohort studies, retrospective cohort studies, case-control studies

Context

Search results will be limited to original articles published in peer-reviewed journals, with no language restrictions. This review will cover papers published until March 8, 2024.

Types of sources

Observational studies will be included. This study excludes randomized controlled trials (RCTs), intervention studies that include non-RCTs, systematic reviews, meta-analyses, case reports, and case series studies.

Methods

This protocol was developed based on the PRISMA extension for Scoping Reviews (PRISMA-ScR) [10]. The scoping review will also be conducted based on the scoping review methodology by the JBI.

Search strategy

The search strategy will be a systematic electronic search using the following databases to find published studies: PubMed, Web of Science, CINAHL (EBSCO), PEDro, and Embase (Dialog). A complete search strategy for the five databases will be developed using the words in the titles and abstracts of the relevant articles (the appendix contains more details).

Study/source of evidence selection

After the search, all identified citations will be collated and uploaded to Rayyan to remove duplicates. In a pilot test, the title and abstract will be reviewed by two independent reviewers and evaluated against the review's inclusion criteria. All potentially relevant papers will be searched, and details of their citations will be incorporated into Rayyan. The full text of the selected citations will be evaluated in detail by two independent reviewers based on the inclusion criteria. The scoping review will note and report the reasons for excluding full-text references that do not meet the inclusion criteria. Disagreements that arise among reviewers at each stage of the selection process will be discussed or resolved with additional reviewers. Search results and the study uptake process will be reported at the final scoping review and presented using the PRISMA 2020 statement flow diagram for scoping reviews.

Data extraction

Data extraction will be performed using a data extraction tool. Data will specifically show findings related to participants, concepts, context, study design, and review questions. Extracted forms will include information such as "author," "title," "year of publication," "study design," "language," "study population characteristics," "independent variable outcomes," and "dependent variable outcomes.

The draft data extraction will be modified and revised as needed during the process of extracting data from each of the included evidence sources. The revisions will be described in

the scoping review.

Disagreements arising among reviewers will be resolved through discussion or with additional reviewers. Incomplete reporting of critical data will be treated as missing data if no response is received within one month of the e-mail communication.

Risk of bias

The quality of the studies will be assessed using the Newcastle-Ottawa Scale (NOS) developed by Wells et al [11].

Data analysis and presentation

The data will be presented in graphical or illustrative or tabular format, depending on the study design and risk factors.

Acknowledgments

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Funding

None.

Conflicts of interest

None.

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Appendix: search strategy

□ PubMed search strategy

("rotator cuff injuries"[MeSH Terms] OR "rotator cuff tear*"[Title/Abstract] OR "rotator cuff injur*"[Title/Abstract] OR "rotator cuff tendin*"[Title/Abstract] OR "rotator cuff related pain"[Title/Abstract]) AND ("association"[MeSH Terms] OR "associat*"[Title/Abstract] OR "risk"[MeSH Terms] OR "risk"[Title/Abstract] OR "causality"[MeSH Terms] OR "etiology"[Title/Abstract] OR "pathology"[MeSH Terms] OR "pathology"[Title/Abstract] OR "cause"[Title/Abstract] OR "predict*"[Title/Abstract]) AND ("pain"[MeSH Terms] OR "pain"[Title/Abstract] OR "symptomatic"[Title/Abstract] OR "asymptomatic"[Title/Abstract])

□ Web of science search strategy

① rotator cuff injuries OR rotator cuff tear* OR rotator cuff injur* OR rotator cuff tendin* OR rotator cuff related pain)

② associat* OR risk OR causality OR etiology OR pathology OR cause OR predict*

③ pain OR pain OR symptomatic OR asymptomatic

④ ① and ② and ③

□ CINAHL search strategy

((MH “rotator cuff injuries”+) OR (TI “rotator cuff tear*” OR AB "rotator cuff tear*") OR (TI "rotator cuff injur*" OR AB "rotator cuff injur*") OR (TI "rotator cuff tendin*" OR AB "rotator cuff tendin*") OR (TI "rotator cuff related pain" OR AB "rotator cuff related pain")) AND ((MH association+) OR (TI associat* OR AB associat*) OR (MH risk+) OR (TI risk OR AB risk) OR (MH causality+) OR (TI etiology OR AB etiology) OR (MH pathology+) O R (TI pathology OR AB pathology) OR (TI cause OR AB cause) OR (TI predict* OR AB

predict*)) AND ((MH pain+) OR (TI pain OR AB pain) OR (TI symptomatic OR AB sym ptomatic) OR (TI asymptomatic OR AB asymptomatic))

☐ PEDro Search strategy

Abstract & Title: rotator and cuff*

☐ Embase Search strategy

(MESH.EXACT.EXPLODE("rotator cuff injuries") OR TI,AB("rotator cuff tear*") OR TI,AB("rotator cuff injur*") OR TI,AB("rotator cuff tendin*") OR TI,AB("rotator cuff related pain")) AND (MESH.EXACT.EXPLODE(association) OR TI,AB(associat*) OR MESH.EXACT.EXPLODE(risk) OR TI,AB(risk) OR MESH.EXACT.EXPLODE(causality) OR TI,AB(etiology) OR MESH.EXACT.EXPLODE(pathology) OR TI,AB(pathology) OR TI,AB(cause) OR TI,AB(predict*)) AND (MESH.EXACT.EXPLODE(pain) OR TI,AB(pain) OR TI,AB(symptomatic) OR TI,AB(asymptomatic))