ELSEVIER

CrossMark

The Spine Journal 16 (2016) 667–675

THE SPINE JOURNAL

Review Article

Quality assessment of systematic reviews for surgical treatment of low back pain: an overview

Delio Eulalio Martins, MD*, Nelson Astur, MD, Michel Kanas, MD, Mário Ferretti, MD, Mario Lenza, MD, Marcelo Wajchenberg, MD

Hospital Israelita Albert Einstein, Av Albert Einstein, 627, Office 306, A1 Building, 05652-900 Sao Paulo, SP, Brazil

Received 21 April 2015; revised 16 October 2015; accepted 15 January 2016

Abstract

BACKGROUND CONTEXT: Low back pain is one of the most frequent reasons for medical appointments. Surgical treatment is widely controversial, and new surgical techniques and treatment modalities have been developed within the last decade. Treatment for low back pain should be evidence-based through systematic reviews and meta-analysis. Thus, the quality of these reviews is sometimes put into question as methodological mistakes are frequently seen.

PURPOSE: The aim of this study was to gather all systematic reviews for the surgical treatment of low back pain and analyze their outcomes, quality, and conclusion.

STUDY DESIGN/SETTING: This is an overview of systematic reviews.

OUTCOME MEASURES: The outcome measures were the AMSTAR (A MeaSurement Tool to Assess systematic Reviews) score, PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement, and conclusion supported by descriptive statistics.

METHODS: A literature search for systematic reviews containing low back pain surgical treatment was conducted through different medical databases. Two investigators independently assessed all titles and abstracts for inclusion. Studies should have at least one surgical procedure as an intervention. Diagnoses were categorized as lumbar disc herniation, spondylolisthesis, stenosis, facet joint syndrome, and degenerative disc disease. Quality was assessed through the PRISMA and AMSTAR questionnaires. Study quality related to its PRISMA or AMSTAR score percentage was rated as very poor (<30%), poor (30%–50%), fair (50%–70%), good (70%–90%), and excellent (>90%). Articles were considered conclusive if they had a conclusion for their primary outcome supported by descriptive statistical evidence. This study was funded exclusively by the authors' own resources. None of the authors have any potential conflict of interest to declare.

RESULTS: Overall, there were 40 systematic reviews included. According to AMSTAR and PRISMA scores, 5% to 7.5% of the systematic reviews were rated as excellent and most of them were rated as a fair review. AMSTAR indicated that 22.5% of the reviews have very poor quality, whereas PRISMA stated that 7.5% were of very poor quality. For both tools, performing a meta-analysis made the reviews' quality significantly better. The best-rated diagnosis groups according to PRISMA were spondylosis, lumbar disc herniation, and degenerative disc disease. Considering the studies' conclusions, 25 (62.5%) out of the 40 systematic reviews had a conclusion to their primary outcome, and only 11 (27.5%) were supported by descriptive statistical analysis. This means that 44% of the systematic reviews with a conclusion were evidence-based. There were 15 (37.5%) systematic reviews that did not reach a conclusion to their primary objectives.

CONCLUSIONS: In conclusion, most systematic reviews for low back pain do not reach very good or excellent quality, and only 27.5% of them have evidence-based conclusions. Including a meta-analysis is a significant factor to improve quality and evidence for systematic reviews.

FDA device/drug status: Not applicable.

Author disclosures: ***DEM:*** Nothing to disclose. ***NA:*** Nothing to disclose. ***MK:*** Nothing to disclose. ***MF:*** Nothing to disclose. ***ML:*** Nothing to disclose. ***MW:*** Nothing to disclose.

* Corresponding author. Hospital Israelita Albert Einstein, Av Albert Einstein, 627, Office 306, A1 Building, 05652-900 Sao Paulo, SP, Brazil. Tel.: +55 1121519393; fax: +55 1121519393.

E-mail address: eulalio@me.com (D.E. Martins)

http://dx.doi.org/10.1016/j.spinee.2016.01.185

1529-9430/

Keywords: Degenerative disc disease; Low back pain; Lumbar spine; Outcome assessment; Surgical procedures; Systematic review

Introduction

The impact of low back pain (LBP) in health care is a major concern as costs are increasing every year and are significantly related to surgical treatment, time to return to work, and work compensation [1,2]. Surgical treatment for LBP is widely controversial, and new surgical techniques and treatment modalities have been developed within the last decade.

For best scientific evidence, outcomes for new and standard interventions should be analyzed through randomized clinical trials [3–5]. However, a majority of treatment modalities for LBP goes through a series of trials with different outcomes among themselves that could be influenced by methodology, population, or even conflicts with authors' interests or research funding [6–9]. When this happens, the best evidence for treatment outcomes is derived from systematic reviews (SR) with a meta-analysis (MA) of those trials. Unfortunately, there is often a great divide between those outcomes and clinical practice.

Treatment for LBP should be evidence-based through SR and MA. Systematic reviews for LBP are widely available in any medical database, but they might lead to different conclusions for the same intervention in the same population. Thus, the quality of these reviews is sometimes put into question as methodological mistakes are frequently seen [10]. Therefore, SR may not be so highly evidenced to guide surgical treatment for the most common degenerative lumbar spine diseases.

The aim of the present study was to gather all SRs for the surgical treatment of LBP and analyze their outcomes, quality, and conclusion.

Materials and methods

Search strategy

An institutional review board approval (Number 1942-14) was obtained. A literature search for SRs that involve only LBP treatment was conducted up to January 2014 through different medical databases: Medline (PubMed), EMBASE (Ovid), Cochrane Database of Systematic Reviews, the Database of Abstracts of Reviews of Effectiveness, and the International Prospective Register of Systematic Reviews (PROSPERO). No restriction to language or date was applied. To minimize risk of missing relevant reviews, a handsearch of the reference lists of reviews captured by the initial search was performed as well. The search strategy used for Medline is shown in Appendix S1. Other databases followed the same search strategy with minimal adjustments. Two investigators (DEM and NA) independently assessed all titles and abstracts to exclude duplicate articles and select potential articles to be included, and a discussion with a third author (ML) was done to resolve inconsistencies. When more than one SR with the same or similar interventions from the same author were found, only the most current one was included and was considered an update of previous work.

Study eligibility criteria

After a list of studies was gathered from all database searches, SRs of studies that involved patients of all ages and that discussed the following diseases were included: lumbar disc herniation, spondylolisthesis, spinal canal stenosis, facet joint syndrome, and degenerative disc diseases. Systematic reviews should have at least one surgical procedure as an intervention, such as injections of any kind, fusion, or decompression such as laminectomy or discectomy. Either open or minimally invasive techniques were considered. Systematic reviews comparing two non-surgical treatments were excluded, as well as those involving cervical or thoracic spine degenerative diseases.

Data extraction

Data were extracted with a standardized form independently by four reviewers (DEM, NA, MK, and MW) who are board-certified in spine surgery. To minimize evaluation bias, all reviewers were primarily trained for each item of both questionnaires by one of the senior authors (ML) with expertise in SRs. All four reviewers assessed the first five papers together so there would be homogeneity on the interpretation of data. The reviewers assessed the following 35 papers independently. Any disagreement that might have arisen was discussed and resolved by consensus and with an opinion of a fifth reviewer (ML) with expertise in SRs. The following items were included in our form and collected for every SR: study design, searched databases, last date of search strategy, presence of a protocol before conduction of the study, funding sources, number of studies included, number of patients assigned, number of patients assessed at the end of the study, inclusion and exclusion criteria, age of participants, diagnoses enrolled, interventions, primary and secondary outcomes, timing of outcome measures, and presence of positive conclusions.

Study quality analysis

The quality of the studies included in the current analysis was assessed through the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) [11] and AMSTAR [12] questionnaires by the same four reviewers. Both forms are validated measurement tools that assess the methodological quality of SRs (Appendices S2 and S3). Each item of the PRISMA form was graded as *yes*, *incomplete*, or