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Review Article

Association between compensation status and outcomes in spine surgery: a meta-analysis of 31 studies

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Abstract

BACKGROUND CONTEXT: Numerous studies have demonstrated poorer outcomes in patients with Workers' compensation (WC) when compared with those without WC following treatment of various of health conditions, including spine disorders. It is thus important to consider compensation status when assessing treatment outcomes in spine surgery. However, reported strengths of association have varied significantly (1.31–7.22).

PURPOSE: The objective of this study was to evaluate the association of unsatisfactory outcomes on compensation status in spine surgery patients.

STUDY DESIGN/SETTING: A meta-analysis was performed.

PATIENT SAMPLE: Patient sample is not applicable in this study.

OUTCOME MEASURE: Demographics, type of surgery, country, follow-up time, patient satisfaction, return to work and non-union events were the outcome measures.

METHODS: Both prospective and retrospective studies that compared outcomes between compensated and non-compensated patients in spine surgery were included. Two independent investigators extracted outcome data. The meta-analysis was performed using Revman software. Random effects model was used to calculate risk ratio (RR, 95% confidence interval [CI]) for dichotomous variables.

RESULTS: Thirty-one studies (13 prospective; 18 retrospective) with a total of 3,567 patients were included in the analysis. Follow-up time varied from 4 months to 10 years. Twelve studies involved only decompression; the rest were fusion. Overall RR of an unsatisfactory outcome was 2.12 [1.74, 2.58; p<.001] in patients with WC when compared with those without WC after surgery. The RR ofan unsatisfactory outcome in patients with WC, compared with those without, was 2.09 [1.38, 3.17]; p<.01 among studies from Europe and Australia, and 2.14 [1.48, 2.60]; p<.01 among US studies.

FDA device/drug status: Not applicable.

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The RR of decompression-only procedures was 2.53 [1.85, 3.47]; p<.01,and 1.79 [1.45, 2.21]; p<.01 for fusion. Forty-three percent (209 of 491) of patients with WC did not return to work versus 17% (214 of 1250) of those without WC (RR 2.07 [1.43, 2.98]; p<.001). Twenty-five percent (74 of 292) and 13.5% (39 of 287) of patients had non-union in the compensated and non-compensated groups, respectively. This was not statistically significant (RR 1.33 [0.92, 1.91]; p=.07).

CONCLUSIONS: Workers' compensation patients have a two-fold increased risk of an unsatisfactory outcome compared with non-compensated patients after surgery. This association was consistent when studies were grouped by country or procedure. Compensation status must be considered in all surgical intervention studies.

Keywords: Meta-analysis; Outcome; Return to work; Spine; Unsatisfactory; Workers' compensation

Introduction

Patients with workers' compensation (WC) have been reported to have significantly more frequent unsatisfactory outcomes than those without it, in various disorders. Although the etiology of this association is not fully known, researchers have suggested various possible contributing factors like psychosocial secondary gains (eg, pecuniary awards that stem from civil litigation), higher severity of injury work environment, smoking status, and body mass index [1–6]. Twenty percent of all work-related injuries are back injuries [7,8], and the influence of financial compensation is still a controversial issue in the treatment of low back pain [7]. Within the setting of spine surgery, numerous studies have reported that the impact of compensation status on outcomes is important [1,9–12]. This highlights the importance of considering compensation status when evaluating outcomes of all intervention studies in spine. Furthermore, reported strength of this association has widely varied from 1.31 [13] to 7.22 [14] among published studies. In the evolving environment of health-care economics and cost-efficacy, this association may be an important influence when it comes to economic and clinical decision making [9]. The purpose of this meta-analysis was to consolidate all studies, both prospective and retrospective, to determine the strength of association of compensation status on unsatisfactory outcomes in spine surgery. In addition, an analysis was performed to determine how the impact of compensation status changes based on study design, country of origin, and procedure type.

Materials and methods

The meta-analysis was performed according to PRISMA statement for quality reporting of systematic reviews and meta-analyses [15].

Electronic literature search

This study involved a systematic search of MEDLINE, EMBASE, Cochrane Collaboration Library, Scopus, and Google Scholar literature that was published between 1994 and 2015 which compared outcomes of the effect of WC status on the outcome in spine surgery. Our results were limited to studies published in the English language. The reference list of every included study was also reviewed for additional literature resources. Searched terms included "workers," "compensation," and "spine."

Study selection

A systematic review that considered all prospective and retrospective studies that investigated the effect of WC on the outcomes of spine surgery was performed. No limitations were placed on age groups or spinal procedures, but studies with spinal tumors or trauma were excluded from this study. Published studies were excluded from this meta-analysis if they did not have a control or non-compensated cohort. Eligible publications were selected by two independent reviewers; disagreements with respect to inclusion in this meta-analysis were settled by a third reviewer.

Quality assessment

Two independent reviewers assessed the quality of each study included in this meta-analysis. The Guyatt and Busse tool for assessment of cohort studies was used to assess bias and quality [16]. Each study was divided into eight bias inquiries, and assessments were registered on a scale of 1 through 4. A score of 1 would reflect the lowest risk of bias, whereas a score of 4 reflects the highest risk. The overall quality of a study is a product of its individual bias scores across the eight disparate inquiries. A score between 8 and 15 represented high quality, 16 and 23 medium quality, and 24 and 32 low quality studies. Studies that carried with it a high risk of bias were discussed among the reviewers for an official determination as to whether they should be included in this meta-analysis.

Data extraction

Each study was thoroughly and independently reviewed by two reviewers to ensure complete and accurate data extraction before their results were compared to resolve discrepancies. General study characteristics extracted were publication date, country of origin, procedure performed, study design, follow-up time (ie, mean, median, and latest), sample sizes of both compensated and non-compensated control