

Research Paper Review

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The course and prognostic factors of symptomatic cervical disc herniation with radiculopathy: a systematic review of the literature

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ABSTRACT

Background Context

Cervical spine disc herniation is a disabling source of cervical radiculopathy. However, little is known about its course and prognosis. Understanding the course and prognosis of symptomatic cervical disc herniation is necessary to guide patients' expectations and assist clinicians in managing patients.

Purpose

To describe the natural history, clinical course, and prognostic factors of symptomatic cervical disc herniations with radiculopathy

Study Design

Systematic review of the literature and best evidence synthesis.

Methods

A systematic search of MEDLINE, EMBASE, CINAHL, SportsDiscus, and the Cochrane Central Register of Controlled Trials from inception to 2013 was conducted to retrieve eligible articles. Eligible articles were critically appraised using the Scottish Intercollegiate Guidelines Network criteria. The results from articles with low risk of bias were analyzed using best evidence synthesis principles.

Results

We identified 1,221 articles. Of those, eight articles were eligible and three were accepted as having a low risk of bias. Two studies pertained to course and one study pertained to prognosis. Most patients with symptomatic cervical disc herniations with radiculopathy initially present with intense pain and moderate levels of disability. However, substantial improvements tend to occur within the first 4 to 6 months post-onset. Time to complete recovery ranged from 24 to 36 months in, approximately, 83% of patients. Patients with a workers' compensation claim appeared to have a poorer prognosis.

Conclusions

Our best evidence synthesis describes the best available evidence on the course and prognosis of cervical disc herniations with radiculopathy. Most patients with symptomatic cervical spine disc herniation with radiculopathy recover. Possible recurrences and time to complete recovery need to be further studied. More studies are also needed to understand the prognostic factors for this condition.ite noise white noise

ANALYSIS

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Background Information

Cervical spine disc herniation is a common cause of cervical radiculopathy. When symptomatic, cervical disc herniations can produce neck and arm pain that typically follows a myotomal pattern and/or sensory symptoms that may follow a dermatomal distribution. Associated upper extremity reflex changes and motor weakness may also be present.

The annual incidence of cervical disc herniations was estimated to be 18.6 per 100,000 among residents of Rochester, Minnesota, with the incidence of the condition peaking in the sixth decade of life (1).

Reported risk factors for cervical spine disc herniation include:

- male gender,
- present cigarette-smoking,
- heavy lifting,
- frequent diving from a board, and
- occupation.

A history of prior physical exertion or trauma was reported to be present in only 14.8% of cases in one study (1).

The initial treatment for cervical disc herniation with radiculopathy is typically conservative care, although about 26% of patients will eventually require surgery (1).

Information on the natural history and clinical course of cervical disc herniation is lacking, making it difficult to manage clinically. In order to better understand the effectiveness of treatment for the condition, as well as its prognosis, the purpose of this systematic review was to describe the natural history, clinical course, and prognostic factors of symptomatic cervical disc herniations with radiculopathy.

PERTINENT RESULTS

The literature search netted 1,221 articles, of which 352 were excluded as duplicates. The titles and abstracts of 869 articles were screened for eligibility; 8 of them met the eligibility criteria and were

critically appraised. Only 3 articles were considered scientifically admissible, but even they had limitations that one should consider when interpreting their results.

Common methodological weaknesses of the articles included:

- not describing the representativeness of the study's sample;
- failing to control for confounding; and
- not having adequate follow-up.

Variation in Defining Cervical Disc Herniation

The criteria for selecting participants with cervical disc herniations varied across the studies; in particular, the definitions of what represents a disc herniation were somewhat different. For instance, in one study participants had to have a cervical disc protrusion and root compression confirmed on MRI with myotomal weakness, whereas in another study participants were included only if they had MRI confirmed single- or two-level cervical herniated discs as interpreted by a spine surgeon or radiologist.

Clinical Presentation & Prognosis

Patients with cervical disc herniation typically presented with intense neck and arm pain with moderate-to-severe levels of disability. Symptoms of radiculopathy were generally described as having a favorable course, with a minority of patients experiencing long-term disability. Most improvements in pain and disability occurred within the first 4 to 6 months following onset.

It was reported that the prognosis for subjects on workers' compensation who had traumatic cervical disc herniations was poorer. Also, subjects with approved workers' compensation claims received more invasive treatment and days off work than those without workers' compensation claims.

CLINICAL APPLICATION & CONCLUSIONS

Clinicians should keep in mind that most subjects in this review experienced considerable improvement 4 to 6 months after the onset of symptoms, although complete recovery usually occurred after 24 to 36 months. Nevertheless, some patients continued to have residual impairments, such as pain and activity limitations. Because of study limitations, it could not be determined if patients had recurrent episodes. It is worth noting that none of the reviewed articles reported on patients with progressive neurologic deficits, or those who developed myelopathy.

When managing care of patients with symptomatic cervical disc herniations, it appears that the prognosis will typically be worse if there is an associated workers' compensation claim. However, this evidence is preliminary, consisting of only one Phase I study (5). Therefore, these findings need to be tested in Phase II and III studies where confounders can adequately be controlled.

It should also be noted that this review only included studies in which radiculopathy was caused by a cervical disc herniation. Studies were purposefully excluded if there were concurrent degenerative changes contributing to the symptoms. One should therefore keep in mind that the clinical course of cervical radiculopathy in patients in which the etiology is due to combined disc herniations and degenerative changes may be different from those with disc herniations alone.

Overall, the course of symptomatic cervical disc herniations with radiculopathy appears to be similar to

neck pain in the general population (i.e. recurrent and sometimes persistent and/or progressive in nature) (2). Furthermore, the early clinical course of the condition is similar to that of lumbar disc herniations (i.e. substantial improvements in pain and disability within the first 6 to 12 months) (3, 4).

STUDY METHODS

The authors of this systematic review conducted electronic searches of a number of biomedical databases, as well as hand-searches of reference lists in relevant Cochrane systematic reviews. The search strategy combined terms related to cervical disc herniations and course/prognosis.

Studies were included if they involved patients with cervical disc herniation and radiculopathy that were confirmed by magnetic resonance imaging (MRI) or computed tomography (CT).

Further criteria for including studies were as follows :

- Published in English;
- human studies on adults (18 years of age or older) and/or children with symptomatic cervical disc herniation with radiculopathy as confirmed on imaging;
- use of clinically relevant outcomes; and
- randomized and quasi-randomized controlled trials (with waiting list or usual care group) or cohort study.

Criteria for excluding studies:

- cervical radiculopathy from other causes (degenerative changes, malignancy, infection, fractures, dislocations, congenital anomalies);
- cervical radiculopathy caused by multiple etiologies (combined cervical disc herniation and foraminal stenosis) unless a stratified analysis for cervical disc herniations was performed;
- subjects had undergone surgical management or invasive interventions (such as injections);
- biomechanical studies, cadaveric studies, systematic reviews, and studies that focused on spinal cord injury (paraplegia, tetraplegia) or myelopathy; and
- studies with less than 20 human subjects with cervical disc herniations.

Relevant outcomes included self-rated recovery, functional recovery (ex. return to activities, work or school), and clinical outcomes (like pain, disability).

The titles and abstracts of citations found during the search were screened for inclusion by 2 reviewers who worked independently using the pre-determined selection criteria. Disagreements were resolved by discussion between the two reviewers to reach consensus.

The papers were critically appraised using the Scottish Intercollegiate Guidelines Network (SIGN) criteria. Rotating pairs of independent reviewers identified strengths, weaknesses, and potential sources of bias in study methodology. Disagreements among reviewers were resolved by consensus and a third independent reviewer was used if consensus could not be reached.

Included studies were classified as being Phase I, II, or III, as described below:

• Phase I studies explore associations between potential prognostic factors and health outcomes in a

descriptive way so that only crude associations are reported.

- Phase II studies involve more extensive exploratory analyses using well formulated comparison groups, stratified and/or multivariable analyses, to focus on sets of prognostic factors.
- Phase III studies test specific hypotheses to confirm or refute the independence of any apparent relationship between a particular prognostic factor and the outcome of interest.

STUDY STRENGTHS / WEAKNESSES

This review emphasized the fact that little research about cervical disc herniations with radiculopathy is available; consequently, not much is known about prognostic factors for the condition. In addition, the validity of the conclusions that were presented is limited by the poor methodological quality of the studies that were included in the review.

Additional high-quality prognostic studies are needed before firm conclusions can be drawn about the clinical course and prognostic factors of cervical disc herniations with radiculopathy.

Additional References

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