The Burden and Determinants of Neck Pain in the General Population

Results of the Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders

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Study Design. Best evidence synthesis.

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Objective. To undertake a best evidence synthesis of the published evidence on the burden and determinants of neck pain and its associated disorders in the general population.

Summary of Background Data. The evidence on burden and determinants of neck pain has not previously been summarized.

Methods. The Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders performed a systematic search and critical review of literature published between 1980 and 2006 to assemble the best evidence on neck pain. Studies meeting criteria for scientific validity were included in a best evidence synthesis.

Results. We identified 469 studies on burden and determinants of neck pain, and judged 249 to be scientifically admissible; 101 articles related to the burden and determinants of neck pain in the general population. Incidence ranged from 0.055 per 1000 person years (disc herniation with radiculopathy) to 213 per 1000 persons (self-reported neck pain). Incidence of neck injuries during competitive sports ranged from 0.02 to 21 per 1000 exposures. The 12-month prevalence of pain typically ranged between 30% and 50%; the 12-month prevalence of activity-limiting pain was 1.7% to 11.5%. Neck pain was more prevalent among women and prevalence peaked in midlife age. Risk factors for neck pain included genetics, poor psychological health, and exposure to tobacco. Disc degeneration was not identified as a risk factor. The use of sporting gear (helmets, face shields) to prevent other types of injury was not associated with increased neck injuries in bicycling, hockey, or skiing.

Conclusion. Neck pain is common. Nonmodifiable risk factors for neck pain included age, gender, and genetics. Modifiable factors included smoking, exposure to tobacco, and psychological health. Disc degeneration was not identified as a risk factor. Future research should concentrate on longitudinal designs exploring preventive strategies and modifiable risk factors for neck pain.

Key words: neck pain, epidemiology, incidence, prevalence, risk factors, associated factors.

In the introduction to this report of the “Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders,” Haldeman et al.1 state that “most people can expect to experience some degree of neck pain in their lifetime.” Summarizing the epidemiology of neck pain is a natural starting point in any investigation of
neck pain. We want to describe who gets neck pain and why. Many reports describing the incidence, prevalence, risk, and associated factors of neck pain appear in the scientific literature. From these, we can better understand the magnitude of the condition to plan and provide appropriate health care. Knowledge about risk and associated factors may also suggest preventive strategies and help to identify and target important subgroups of the population at greatest risk for neck pain.

The main objective of the Neck Pain Task Force report was to systematically search the scientific literature on neck pain and produce a best evidence synthesis on the epidemiology (incidence, risk factors, prevalence and factors associated with prevalent neck pain), diagnosis, treatment, and course and prognosis of neck pain. In this article, we present the results of a systematic review of the scientific literature and our best evidence synthesis on the incidence, risk factors, prevalence, and associated factors for neck pain in the general population.

Materials and Methods

Design and Data Collection

The literature search and critical review strategy is outlined in detail elsewhere. We systematically searched the electronic database Medline for literature published from 1980 through 2005 on neck pain and its associated disorders; we also systematically checked reference lists of relevant articles and updated the search to include key articles for 2006 and early 2007.

Relevance Screening

We screened each citation for relevance to the Neck Pain Task Force mandate, using a priori inclusion and exclusion criteria; however, we made no attempt to assess the scientific quality of each study when establishing its relevance. Screening criteria are reported in more detail in Carroll et al. Studies were considered relevant if they pertained to the assessment, incidence, prevalence, determinants or risk factors, prevention, course, prognosis, treatment and rehabilitation, or economic costs of neck pain; if they contained data and findings specific to neck pain; if they contained data and findings specific to neck pain and/or disorders associated with neck pain; if they included at least 20 persons with neck pain or at risk for neck pain; or if they described a systematic review of the literature on neck pain. We excluded studies on neck pain that was associated with serious local pathology or systemic disease, such as neck pain from fractures or dislocations (except where such studies inform differential diagnosis in neck pain); myelopathy; rheumatoid arthritis and other inflammatory joint diseases; or tumors.

Quality Assessment

Rotating pairs of Scientific Secretariat members performed independent, in-depth critical reviews of each article, identifying methodologic strengths and weaknesses, and made decisions about the article’s scientific merit after discussions of each article. (The criteria used in the methodologic appraisal of the studies can be viewed by going to Article Plus). Our methodologic appraisal focused on sources of potential selection bias, information bias, confounding; and consideration of whether these biases would likely result in erroneous or misleading conclusions. Studies judged to have adequate internal validity were considered “scientifically admissible” and were included in our best evidence synthesis.

Analysis

In the current article, we report our best evidence synthesis of scientifically admissible studies related to incidence, risk factors, prevalence, and factors associated with prevalent neck pain in the general population, pertaining to any age and including groups participating in leisure activities such as sports. The best evidence synthesis of studies pertaining to the risk of neck pain in particular occupational groups, or risk or associated factors for neck pain arising at work are reported elsewhere, as are studies pertaining to risk of traffic-related whiplash-associated disorders (WAD).

In this best evidence synthesis, we classified studies according to whether they provided information about incidence and/or risk factors (cohort, case/control, and twin studies) or about prevalence and/or factors associated with prevalent neck pain (cross-sectional studies). Whereas risk factors predict future neck pain, factors associated with prevalent neck pain (identified from cross-sectional studies) coexist with neck pain and therefore might be risk factors for neck pain, prognostic factors for neck pain or consequences of neck pain.

Further grouping was driven by the content of the identified evidence. For instance, several cohort and case-control studies of neck injury in sports were grouped together. Similarly, it was practical to divide the cross-sectional studies into those concentrating on children or adolescents and those including adults. Studies of risk factors—cohort studies and case-control studies—were further classified using a methodology proposed for prognostic factors, but also previously adapted for studies of risk. This classification distinguishes 3 types of study:

- Phase I studies are exploratory, hypothesis generating studies characterized by descriptive exploration and demonstration of crude (unadjusted) associations.
- Phase II studies are also exploratory, but employ multivariable techniques or stratification to identify risk factors related to the onset of neck pain while adjusting for other factors.
- Phase III studies are confirmatory studies of a priori hypotheses which verify one or more factors as independent risk factors for the incidence of neck pain after adjusting for confounding.

In accordance with our conceptual frame work on the course and care of neck pain, risk and associated factors for neck pain were organized into categories, namely Demographics/Socioeconomic Factors, Prior Health/Prior Pain/Comorbidities, Collision/Workplace Factors, Psychological and Social Factors, Compensation/Laws/Societal Factors, Genetics, Health Behaviors, and Cultural Factors.

Incidence rates, estimates of prevalence, and relative risks with confidence intervals (CIs) are presented in the tables as reported in the original articles, or when possible, as calculated from raw data provided in those articles. Exact CIs were calculated using SAS V9.1.

Results

We critically appraised 469 studies related to the epidemiology of neck pain (incidence, risk factors, prevalence, and factors associated with prevalent neck pain), and judged 249 of these to be scientifically admissible. Of