

The prevalence of neck pain

A population-based study from northern Sweden

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ABSTRACT – The two northernmost counties in Sweden form together 1 of the 39 collaborating centers in the World Health Organization (WHO) MONICA (MONItoring of trends and determinants in CARDiovascular disease) project. At the last survey in 1999, we added some questions about cervical spine complaints. Persons randomly selected from the population in a geographically well-defined area completed a self-administered questionnaire. The sample included 8,356 subjects and 6,000 (72%) of them answered.

43% of the population reported neck pain, more women (48%) than men (38%). Women of working age had more neck pain than older ones, a phenomenon not seen among men. Chronic neck pain, defined as continuous pain of more than 6 months' duration, was commoner in women (22%) than men (16%). More than one fourth of the cases with chronic symptoms had a history of neck or head trauma and one third of these had sustained a whiplash type of injury. Thus, all types of neck trauma seem to be associated with chronic neck pain.

There is general agreement that the frequency of neck pain in various populations is quite high and that this symptom greatly affects the person's quality of life and need for health care (Brattberg et al. 1989, Côté et al. 1998). Neck problems also account for a large proportion of occupational illness and disability and place a heavy load on the compensation insurance systems (Statistics (SCB) Sweden 1992).

The population-based studies on prevalence of neck pain are not entirely comparable because of differences in their designs (Brattberg et al. 1989, Andersson et al. 1993, Hasvold and Johnsen 1993).

The definitions of neck pain vary as well as the period for the assessment and, consequently, the reported prevalence figures differ as well.

The epidemiology of neck pain is important for several reasons. More knowledge about the size and extent of this problem would facilitate accurate predictions of the need for medical services and direct resources. Moreover, the prevalence of neck pain in the general population is essential for determining the relation between trauma and occupation.

It is disputed whether a whiplash type of trauma is a major pathogenetic factor for the development of chronic neck pain. Mäkelä et al. (1991) found that the prevalence of the neck syndrome was associated with a history of injury as well as mental and physical stress at work while Bovim et al. (1994) reported that the prevalence of persistent pain after whiplash was the same as the prevalence of chronic neck pain in the general population.

We assessed the prevalence of non-traumatic and traumatic neck pain, and describe age, gender and demographic characteristics in a randomly selected population in a geographically well-defined area in the northern part of Sweden.

Patients and methods

The two northernmost counties in Sweden constitute together 1 of the 39 collaborating centers in the World Health Organization (WHO) MONICA (MONItoring of trends and determinants in CARDiovascular disease) project (1990). The main aim of this project is to assess risk factors for cardiovascular diseases. 4 population surveys have

been done and, in the last in 1999, some questions about the population's experience of cervical, thoracic and lumbar pain were added. The MONICA questionnaire, which mainly concerns sociodemographic data and cardiovascular risk factors, was filled in by the participants during their visit for a health examination. The additional questions on cervical spine problems were: 1) Have you visited a doctor because of a neck or head injury? Yes, due to whiplash injury; other neck injury; head injury: no. 2) If you have neck pain, how long have you had symptoms? Last week; last 6 months; more than 6 months. 3) If you have neck pain, how often do you have symptoms? Continuously; some times every month; a few times every year.

The northern Sweden MONICA study covers a populated area of 154,000 km², with a total population of 510,000 and a target population of 310,000 in the age range 25–74 years. Most of the inhabitants live in municipalities along the coastal area. In accord with the MONICA study protocol (1990), we selected the population by stratified randomization for age and sex. The sample included 8,356 subjects and 6,000 of them (72%) answered the questionnaire.

Patients seeking medical attention after a cervical spine injury with persistent posttraumatic complaints were defined as having injury-related neck pain. The alternatives in the questionnaire were whiplash, other neck or head injury, or no injury. Each person could report more than one alternative. Chronic neck pain was defined as continuous neck complaints for more than 6 months.

Statistics

We used logistic regression to test for differences in neck pain between various population groups. When appropriate, the test and odds ratio estimates were adjusted for sex and age. Prevalence is presented with the 95% confidence intervals (CI), calculated by normal approximations.

Results

43 (41–44)% of the population reported neck pain. It was less frequent among men than women ($p < 0.001$, overall test adjusted for age group) since almost every other woman, 48 (46–49)%,

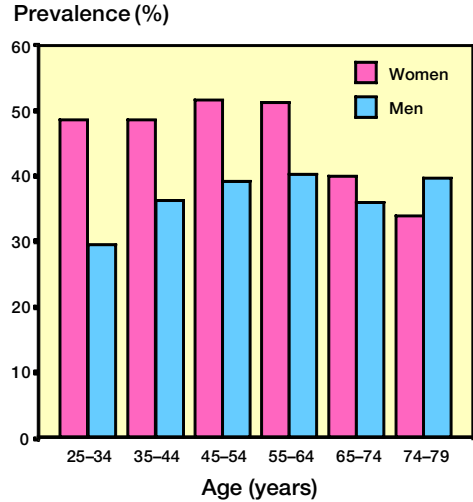


Figure 1. The prevalence of neck pain.

had such pain while the corresponding figure for men was 38 (36–39)%. The estimated odds ratio (men/women) was 0.66, CI = (0.60, 0.73). Neck pain was less frequent among older women (65 years) than in women of working age ($p < 0.001$). The same tendency was not seen among men, which means that the difference between men and women as regards the prevalence of neck pain was not significant in the two highest age groups (Figure 1).

We also studied the relation between the duration and frequency of neck pain. 43% of women and 33% of men reported neck pain with a duration exceeding 6 months. Thus, most persons had had neck pain for a long time. About half of these had continuous symptoms—i.e., a prevalence of 17% in men and 23% in women.

Chronic neck pain, defined as continuous pain of more than 6 months' duration, was reported by 19 (18–20)%, 22 (20–23)% of the women and 16 (14–17)% of the men ($p < 0.001$), odds ratio 0.66, CI = (0.58–0.76) (Figure 2). Most of these cases (13%) had no history of trauma. Thus, 5.2% of the total population with chronic neck pain had a history of trauma to the cervical spine. The prevalence of whiplash injuries in the total population was 3%, other neck injuries 4.5%, head and combined injuries 5.5%. When we evaluated the patients with chronic neck pain and a history of traumatic to the cervical spine separately, 89 of 181 whiplash cases (1.5% of the population) and 133 of 267 cases with

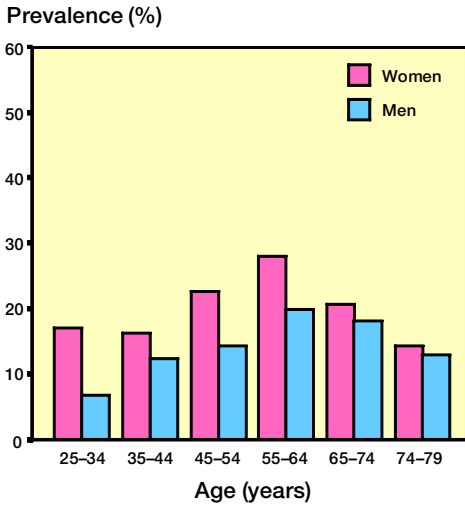


Figure 2. The prevalence of chronic neck pain.

other neck injuries (2.2% of the population) had chronic complaints. Female gender predominated in the trauma group with chronic symptoms. This was particularly true of cases with a history of head injury, where females constituted 64%, while females accounted for 55% in the group with whiplash and other neck injuries.

Community size was dichotomized into 2 groups—i.e., more or less than 15,000 inhabitants. The prevalence of chronic neck pain in small communities was higher than in large ones (Figure 3). The Mantel-Haenszel test, adjusted for both sex

and age, showed a statistically significant difference ($p < 0.001$, OR = 1.35, CI = (1.18, 1.55)). When we evaluated men and women separately, and adjusted for age, the difference was statistically significant for women ($p = 0.05$, OR = 1.20, CI = (1.00, 1.42)), and for men ($p < 0.001$, OR = 1.61, CI = (1.31, 1.98)).

Discussion

Musculoskeletal complaints have been reported to account for 90% of the painful disorders in the population and the neck-shoulder area was the commonest site of pain (Andersson et al. 1993).

We wished to evaluate the prevalence of neck pain in the general population, especially the effect of neck trauma on prevalence. Our study was part of a comprehensive population study. In the questionnaire, we enquired about nonspecific neck-related symptoms. In the trauma cases, we required an injury, severe enough to visit a doctor. Thus, most of our cases have no validated diagnosis, but in the trauma cases, we divided the patients into four categories according to the type of trauma. Whiplash is a well-known disorder and we have no reason to believe that the patients are not aware of this condition.

Information was collected about the persons who did not attend the surveys. We tried to contact all

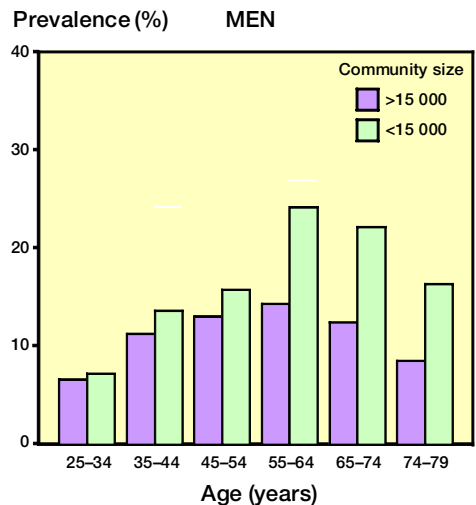
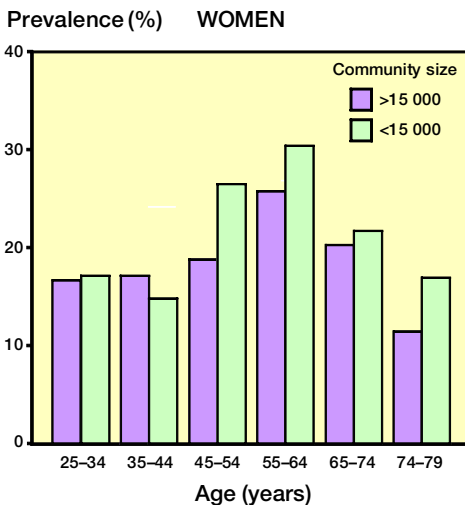


Figure 3. The prevalence of chronic neck pain and community size.

non-participants by telephone interviews or questionnaires and obtained basic information about 50% of them. Fewer of them had been informed about high blood pressure, they were more often regular cigarette smokers and had a somewhat lower BMI (self-reported) than the participants. Furthermore, a smaller proportion of non-participants than participants were married or cohabited. However, there were no substantial differences in their level of education. Thus we are convinced that these differences did not affect the results.

The prevalence of all kinds of neck pain in the population was 43%. It is difficult to compare our findings with other studies because of its different study design. However, in a study of a similar population Côté et al. (1998) also reported a high prevalence.

The prevalence of chronic neck pain in our population was 19%. In a study from Sweden, 17% of the population reported chronic neck pain (Andersson et al. 1993) while Brattberg et al. (1989) reported a prevalence of neck pain exceeding 6 months' duration in 19%. Hasvold et al. (1993) in a Norwegian study found that 15% of males and 25% of females complained of neck ache weekly. Despite these differences in study design, epidemiological studies during a 10-year period show similar prevalence figures. The prevalence of whiplash injuries in the total population was 3%. Recent reports indicate an increase in the incidence of whiplash injuries during the last few years (Holm et al. 1999). The present study covers a sparsely populated area and the prevalence of whiplash injuries is probably higher in densely populated areas with different traffic conditions.

More than one fourth of all cases with chronic neck pain had a history of a neck/head trauma and nearly one third of these had sustained a whiplash type of injury. From another point of view, half of those who reported that they had sustained a whiplash or another type of neck injury had chronic neck pain. Thus, a positive association was found between a history of trauma and neck pain. Our data do not permit us to estimate when the injury occurred in relation to the development of neck pain and therefore it is not possible to comment on causation. Further, it seems likely that some of these had neck pain before they sustained a neck injury.

Our results agree with those of Mäkelä et al. (1991) and of Côté et al. (2000) who reported that neck pain was commoner in persons with a history of neck injuries. These findings are contrary to the results of a retrospective questionnaire-based study from Lithuania (Schröder et al. 1996) and the proposals based on a study on the prevalence of neck pain in the general population (Bovim et al. 1994). In both these papers, the authors concluded that the prevalence of neck pain is the same in a population with neck injuries from car accidents and an uninjured population.

The sex distribution with more neck pain in women, except in the oldest age group, has also been reported before (Andersson et al. 1993). This gender pattern is seen in most types of body pain (Philips 1977, Fordyce 1982) and several sociological, cultural and physical differences have been proposed as explanations, but these hypotheses have not been shown to be satisfactory.

Our finding that chronic neck pain is not uncommon in young people has been noted by others (Andersson et al. 1993). Thus, pain is not exclusively a symptom of aging.

We have no simple explanation of our finding that the prevalence of chronic neck pain in small communities was significantly higher than in large ones. The high unemployment rate, the predominant blue-collar work and the few opportunities to change work in these areas may influence the results.

In conclusion, we found a high prevalence of neck pain in our sparsely populated area. The overall prevalence of all types of neck pain and of chronic neck pain was higher in females. All types of neck trauma, not only whiplash injury, seem to be associated with chronic neck pain.

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