



PAIN

Clinical Updates

INTERNATIONAL ASSOCIATION FOR THE STUDY OF PAIN®

Volume XI, No. 2

June 2003

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How Prevalent Is Chronic Pain?

Chronic pain (CP) is among the most disabling and costly afflictions in North America,¹ Europe, and Australia (see below). Its burden is likely to be equally important in developing countries, for which data are not established. This issue of *Pain: Clinical Updates* summarizes a systematic review (SR)² by the authors on the prevalence of CP in several developed nations. The SR is a widely used method to synthesize the literature; it includes a comprehensive search, critical appraisal of the quality of the selected studies, and pooled analysis, either qualitative or quantitative, of the results. Our SR analyzed studies according to relevant variables such as the definition each used for CP, and each study's sample size, response rate, and methodological quality. We calculated a quality score for each study based on criteria and a scoring system proposed by Loney et al.^{3,4} When possible and appropriate to do so, we weighted each study's prevalence estimate according to its sample size in order to combine these values into a single estimate.

Efforts to determine the prevalence of CP in the general population have been faced with challenges such as variations according to the population sampled, the methods used to collect data, and the criteria used to define CP. Standard internationally accepted definitions for "chronic" or "severe" pain are not available. Differences in the definitions of CP are one reason why prevalence estimates differ greatly from one research study to another. Yet access to reliable data on prevalence—the proportion of a defined population that has CP at some specified time—is an important prerequisite for efficient planning of health services. Understanding factors that underlie variation in prevalence estimates of CP can advance our understanding of its public health impact.

The International Association for the Study of Pain (IASP) provides a widely used definition of CP that takes into account duration and "appropriateness."⁵ IASP defines CP as pain without apparent biological value that has persisted beyond the normal tissue healing time (usually taken to be 3 months). In the context of chronic widespread pain (CWP) the definition by the American College of Rheumatology (ACR)⁶ was used in the research literature we reviewed. Criteria for CWP are met if all of the following have been present for at least 3 months: pain in the left side of the body, pain in the right side of the body, pain above the waist, and pain below the waist. In addition, axial skeletal pain (cervical spine, anterior chest, thoracic spine, or low back) must be present.

Prevalence Rates

We identified 32 potentially eligible publications and excluded 19 of these from the analyses, leaving 13 for evaluation. Studies were excluded if they focused on acute pain, pain of a specific diagnostic category or body area, pain secondary to a defined medical disease, or pain occurring in a particular setting or community. The studies included were published between 1991 and 2002 (see Table I for details). Three studies were conducted in the United Kingdom,⁷⁻⁹

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Table I. Comparative description of the characteristics of 13 studies on chronic pain

Reference, Country	Pooled Prevalence Estimate (Male and Female)	Definition of CP: Duration and Criteria	Sample Size (N)	Setting	Method of Data Collection	Pain Outcome (Type)	Valid and Reliable Instrument	Response Rate (%)	Quality Score
Andersson et al. 1993 ¹⁸ ; Sweden	49.8% (95% CI: 47.4–52.2%) (801/1609)	Dysfunctional CP > 6 months	1,609	General population	Postal questionnaire	Primary	Yes	89	86/90
	55.2% (95% CI: 52.8–57.6) (885/1609)	Pain > 3 months (IASP criteria)							
Blyth et al. 2001 ¹⁰ ; Australia	18.5% (95% CI: 17.8–19.3%)	Pain most days for 3 months (IASP criteria)	17,496	General population	Computer-assisted telephone interview	Secondary	N/A	70.8	80/90
Bowsher et al. 1991 ⁹ ; United Kingdom	11.5% (119/1037)	Pain > 3 months (IASP criteria)	1,037	General population	Telephone interview	Primary	N/A	N/A	70/9
Catala et al. 2002 ¹⁷ ; Spain	23.4% (1170/5000)	Pain > 3 months (IASP criteria)	5,000	General population	Telephone interview	Primary	Unclear	54.6	76/90
Elliot et al. 1999 ¹⁶ ; Scotland	50.4% (1817/3605) (range: 39.4–61.2%)	Pain or discomfort continuously or intermittently > 3 months (IASP criteria)	3,605	Primary care	Postal questionnaire	Primary	Yes	82.3	76/90
Perquin et al. 2000 ¹⁵ ; Netherlands	25% (1358/5423)	Recurrent or continuous pain > 3 months (IASP criteria)	5,423	General population	Postal questionnaire and self-completed questionnaire	Primary	Unclear	82	82/90
Helme and Gibson 1997 ¹¹ ; Australia	50.2% (497/990)	Pain > 3 months (IASP criteria)	990	General population	Face-to-face interview	Secondary	N/A	70	63/90
MacFarlane et al. 1997 ⁸ ; United Kingdom	13% (252/1953)	Pain > 3 months (ACR criteria)	1,953	General population	Postal questionnaire	Primary	N/A	75	66/90
Croft et al. 1993 ⁷ ; United Kingdom	13% (164/1340)	CWP > 3 months (ACR criteria)	1,340	General population	Postal questionnaire	Primary	N/A	66	72/90
	35%	CP > 3 months							
Buskila et al. 2000 ¹⁴ ; Israel	10.1% (532/2210)	Current widespread or regional pain for at least 3 months (ACR criteria)	2,210	General population	Face-to-face interview	Primary	N/A	95.2	84/90
Birse and Lander 1998 ¹² ; Canada	44.4% (95% CI: 41.8–45.4%) (182/410)	Continuous or intermittent pain for at least 6 months	410	General population	Telephone interview	Primary	Unclear	69	76/90
Brochet et al. 1998 ¹³ ; France	32.9% (244/741)	Persistent pain: daily pain > 6 months	741	General population	Face-to-face interview	Secondary	Incomplete data	100	77/90
Gureje et al. 1998 ¹⁹ ; World Health Organization	21.5% (1169/5438)	Current and persistent pain most of the time for 6 months or more during the prior year	5,438	Primary care	Face-to-face interview	Secondary	Yes	62	58/90

two in Australia,^{10,11} and one each in Canada,¹² France,¹³ Israel,¹⁴ The Netherlands,¹⁵ Scotland,¹⁶ Spain,¹⁷ and Sweden.¹⁸ We also included a multinational study conducted by the World Health Organization¹⁹ with collaborative centers in Chile, Germany, Brazil, Turkey, France, The Netherlands, England, India, the United States, Italy, China, Greece, Japan, and Nigeria. Eleven of the included studies⁷⁻¹⁷ surveyed the general population, and two studies^{16,19} surveyed those receiving care in primary care settings.

Ten studies^{7-10,12,14,16-19} reported separate prevalence estimates for adolescent and adult populations (age range 15–86 years). Two studies^{11,13} provided prevalence data exclusively for elderly populations (65 years or over). One further study

addressed the prevalence of CP in children up to 18 years old.¹⁵

Sample sizes varied from 410¹² to 17,496¹⁰ participants of both genders. The number of male participants in those studies that reported raw data by gender ranged from 158¹² to 2,653.¹⁵ The corresponding number of female participants ranged from 252¹² to 2,770.¹⁵ Five studies^{7,8,15,16,18} used postal questionnaires. Four studies^{9,10,12,17} conducted telephone interviews, and four studies used face-to-face interviews^{11,13,14,19} to collect data.

Pain was the main outcome measure in nine studies.^{7-9,12,14-18} Data on CP, however, were collected in four studies^{10,11,13,19} as part of broad surveys that assessed several aspects of the general health status of the community. The minimum duration of CP was set in several ways. Four studies^{12,13,18,19} applied 6 months

and of these, one study¹⁸ also employed a 3-month criterion. The remaining nine studies^{7,11,14-17} all used 3 months to define the minimum duration of CP.

When formal criteria were used to define CP, three studies^{7,8,14} reported that they used the ACR definition of CWP, while seven studies^{9-11,15-18} used the IASP definition of CP or a close approximation. Three further studies^{12,13,19} used other or unspecified criteria. With regard to other pain descriptors, the studies were mixed. Parameters such as pain location, intensity, frequency, and associated disability were not investigated in all studies. Even when the same definition of CP was used as a basis for case finding, the precise phrasing of questions to evaluate pain parameters and the sequence in which they were posed were quite different across studies.

Other important outcomes related to perceptions of health, seeking of medical care, use of analgesics, or health care resources were not consistently investigated. Six studies^{9,11,12,15,18,19} provided information about the location of pain among CP sufferers. Four studies^{9,11,12,15} reported the frequency or the time spent in pain among those with CP. Severity was defined in many ways including intensity, disability, and interference with daily activities. Nine studies^{9,10,12-16,18,19} provided information about how severity was defined for the purposes of their study, and four studies provided data on perceived causes of pain or associated disorders.^{7,9,14,16} Finally, three studies^{10,12,19} provided information on perceived health status, and four studies^{8,9,14,16} reported on the use of health services or analgesics.

Studies That Used the IASP Definition of CP

Seven studies^{9-11,15-18} provided a definition of CP equivalent to the IASP definition. Two studies that involved only children¹⁵ or the elderly¹¹ are described separately below. Based on the information provided by four^{9,16-18} out of the five studies (one study¹⁰ was excluded from the calculations because of inconsistencies in the reported figures within that study), the weighted mean prevalence of CP was 35.5%. Prevalence estimates ranged from 11.5%⁹ to 55.2%.¹⁸ The weighted mean prevalence of CP among male and female populations was 31.0% (range: 9.1–54.9%) and 39.6% (range: 13.4–55.5%), respectively.

Five primary studies^{9,10,15,16,18} provided data on the number of CP sufferers with severe, limiting, or disabling CP. This information was collected in very different ways, and definitions of severity were not directly comparable among the studies. Severity of CP can be defined in terms of disability, interference, or intensity. For example, severity was measured in one study¹⁸ according to a rating scale graded from 1 (weak) to 5 (intense), while in another¹⁶ it was rated from Grade 0 (pain free) to Grade IV (high disability, severely limiting CP). Nonetheless, it may be assumed that underlying these varied definitions is the shared motive to identify and characterize persons or groups that may require a greater amount of health care services. Pooling the results of the studies in adults, we conclude that the prevalence of severe CP (however it is defined) in the general population is approximately 11% among adults.

Studies That Used the ACR Definition of Chronic Widespread Pain

Three studies reported the prevalence of CWP in the general population.^{7,8,14} The weighted mean prevalence of CWP was 11.8% (range: 10.1–13%). All the studies provided estimates of prevalence by gender. The weighted mean prevalence of CWP among male and female populations was 7.2% (range: 3–10.5%)

and 14.7% (range: 14.7–14.9%), respectively. On a cautionary note, even though the variation of prevalence estimates on CWP is low, these estimates are based upon only three studies.

Studies in Children and Elderly Populations

One study,¹⁵ using the IASP definition, found the prevalence of CP in children (up to 18 years old) to be 25%. The distribution of CP by gender was 19.5% for males and 30.4% for females. “Very frequent and more intense pain” in children from the general population was 8%.¹⁵ Two studies^{11,13} described the prevalence of CP in the elderly general population (those aged 65 years and older). One study¹¹ used the IASP definition and calculated a pooled prevalence for both genders of 50.2%. Prevalence estimates by gender were not reported. The other study¹³ calculated a total prevalence of 32.9% and a distribution of CP by gender of 23.7% for males and 40.1% for females.

Discussion

Findings from our SR are similar to previously published SRs on CP.^{20,21} All of these SRs have observed that the studies included are heterogeneous in many ways, and report great variability in the prevalence estimates. Heterogeneity in the populations studied, the occurrence of undetected comorbidity, the application of different definitions of CP, and different approaches to data collection are sources of variation in the prevalence estimates.

Although almost all the studies discussed here were conducted in a predominantly Anglo-Saxon environment (northwest Europe, North America, and Australia), it is probable that social and cultural differences in the experience and report of pain are also important. The nature of the questions posed in the studies as to the temporal nature of pain are another key source of variability in the prevalence estimates. CP may be defined both in terms of duration and frequency, and the questions used in the studies to explore these domains were not comparable.

The influence of the order in which specific questions are posed upon the resulting estimates of CP prevalence is unknown. For example, if the first question asks the respondent to identify “any” pain and later questions address the location of the pain, this may result in a different CP prevalence estimate than if one asks first about pain in each anatomical site and then probes the details.¹¹ The studies used several different CP case definitions. Some definitions included measures of severity, some included measures of disability, some included both severity and disability measures, and others had no restricted case definitions.

Not all the studies specified characteristics such as location, continuous or intermittent nature, quality and severity at different times, and degree of pain-related disability. Such differences between, and gaps within, the questionnaires might contribute to artifactually high variation in prevalence.²²

Variability of data collection methods may also produce differences in prevalence estimates. Studies that used telephone surveys found lower prevalence rates than those that used postal questionnaires. There is not enough information to explain the direction and magnitude of this effect.

The differences in prevalence estimates when the studies are divided according to the ACR and IASP definitions reflect differences in the comprehensiveness, i.e., sensitivity, of these criteria. The ACR definition is, after all, a subset of the IASP definition. All patients with pain that has persisted beyond the normal tissue healing are IASP-defined CP patients. Only if such pain involves four different parts of the body can the patient be

considered an ACR-defined CWP patient.

Little variation was observed among the three studies that used the ACR criteria (weighed mean: 11.83%, range: 10.1–13%). Studies that used the IASP definition showed greater variation in their prevalence estimates (weighed mean: 35.5%, range: 10.5–55.2%). Differences in the application of criteria for CP may account for some of the discrepancies observed in the studies. The questionnaires employed in the studies using the ACR criteria were more comprehensive and similar.

Studies using the IASP definition and providing information about CP severity using proxy definitions such as intensity, level of functional limitations, and disability yielded similar prevalence estimates to those using the ACR criteria. Prevalence estimates of severe CP using the IASP criteria ranged from 8% in children to around 11% in adults.

Conclusions

CP prevalence estimates reported in the 13 studies range from 10.1% to 55.2%. The data reported in these studies indicate a higher prevalence of CP among females (usually from musculoskeletal origin) and significant use of health care resources by CP sufferers. Given that costs associated with severe CP must be considerable for health systems, individuals, and society, management of CP must be assigned high priority.

Estimates of the size and characteristics of the population affected by CP provide a basis to design and deliver therapeutic efforts for those most likely to need and benefit from them. More stringent, systematic, and uniform methodological approaches to determine the prevalence of CP are needed. The single most important recommendation in the context of a research agenda is to conduct concurrent, prospective epidemiological studies to estimate the CP prevalence using clear, standardized case definitions and well-validated and reliable data collection tools. Quality of life is a further consideration that should also be addressed in these studies.

This SR provides strong evidence for the impact that various aspects of these studies' methodology have upon prevalence estimates. Differences in the demographic characteristics of participants, the use of formal criteria to define CP, the types of questions used for case definition, the methods of data collection, and the capture of CP measures as primary or secondary study outcomes should be taken into account. Yet because our criteria for study inclusion and exclusion led us to ignore reports of groups with known medical conditions, the global toll of CP is most likely greater than our pooled estimates. Developing countries, which for the most part lack health care resources even to conduct surveys of CP, arguably bear a disproportionate burden.

Acknowledgments

The information-sharing group provided advice and comments for the report on which this article is based: Mr. H. Borowski (Strategy Development, Alberta Health and Wellness, Edmonton), Dr. S. Rashiq (Division of Pain Medicine, Department of Anaesthesiology and Pain Medicine, University of Alberta, Edmonton), Dr. D. Schlopflocher (Health Surveillance, Alberta Health and Wellness, Edmonton), and Dr. P. Taenzer (Calgary Chronic Pain Centre, Calgary Health Region, Calgary). Expert peer reviewers of the report² were: Dr. A. Jadad (Centre for Global eHealth Innovation, University Health Network, University of Toronto), Dr. T.J. Murray (Department of Medicine, Dalhousie University, Halifax, Nova Scotia), Dr. R. Nickel (Klinik für Psychosomatische Medizin und Psychotherapie, Mainz, Germany), and Dr. P. Verhaak (Netherlands Institute of Primary Health Care, Utrecht).

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