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ORIGINAL ARTICLE

Prevalence and characteristics of chronic musculoskeletal pain in Japan: A second survey of people with or without chronic pain

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Abstract
Background An epidemiological survey conducted in Japan in fiscal year 2010 revealed a high prevalence of chronic musculoskeletal pain, low patient satisfaction with treatment, a high incidence of protracted treatment lasting a year or more, and reduced quality of life. To improve the current system for treating chronic musculoskeletal pain, it is important to identify risk factors, including patient characteristics, for developing chronic pain. Thus, we sought to determine the incidence of new chronic pain in the Japanese population, as well as the persistence rate, associated factors, and current state of treatment of chronic pain, by repeating a postal survey in a nationwide representative sample group first surveyed in 2010.
Methods Among 11,507 participants in the 2010 epidemiological survey, 1,717 reported chronic pain and 6,283 reported no chronic pain. A repeat questionnaire, mailed to subjects in these 2 groups in fiscal year 2011, received replies from 85 % of those who reported pain and 76 % of those without pain in 2010.
Results The incidence of new chronic pain was 11.1 %. Risk factors for developing chronic pain included working in a professional, managerial, or clerical/specialist occupation, being female, having a BMI $\geq$25; currently using alcohol or cigarettes; and having completed an education level of vocational school or higher. Persistent chronic pain was reported by 45.2 % of respondents. Those with severe (VAS score $\geq$7) and constant lower-back pain lasting more than 5 years had the highest risk of the pain persisting. More than 80 % respondents with persistent chronic pain had a history of treatment, and while about 30 % were still receiving treatment at the time of the survey, the other 50 % had discontinued treatment despite the persistence of pain because of a low degree of satisfaction with treatment.
Discussion We identified risk factors related to the development of new chronic pain and the persistence of chronic pain. Countermeasures to prevent chronic pain could be especially important for the high-risk populations for understanding the pathology of chronic pain.

Introduction

The National Livelihood Survey found motor-organ pain in the form of low back pain, stiff shoulders, and arthralgia to be the most common symptoms [1] suffered by the Japanese public. However, we do not know enough about these symptoms, even at a basic level, to create effective strategies to counteract chronic pain in our country. The Survey Study on Chronic Musculoskeletal Pain, conducted in Japan in 2010, found that chronic musculoskeletal pain had a symptom prevalence of 15.4 % and that 42 % of people reporting chronic musculoskeletal pain had received treatment. The treatment period became protracted, lasting a year or more, in 70 % of those who were treated, and patient satisfaction with treatment was low. We also found that chronic musculoskeletal pain strongly impacted the

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sufferer's life through both a loss of social activity and a long-term increase in the degree of assistance needed in daily life and also strongly affected the lives of people around the one suffering pain in Japan [2]. This emphasizes the importance of identifying the characteristics and risk factors of patients whose pain becomes chronic, and establishing preventive measures. In the present study, we repeated a postal survey of a representative nationwide sample to examine the incidence of new chronic pain, the chronic pain persistence rate, factors associated with chronic pain, and the actual state of treatment for those with persistent, chronic pain in Japan.

Methods

The original survey group, a nationwide, randomly selected sample, was chosen in 2010 through the Mail-in Survey Panel maintained by the Nippon Research Center [2]. The Panel is based on a randomly selected address-based sample with gender and age distributions similar to those in the national population census. To create a mailing address sample that reflected the demographic composition of the Japanese population, subjects were specified as being residents of Japan who were 18 or more years of age, and quotas were set for gender, age, and regional distribution to correspond to the population as a whole. The 2010 survey included 11,507 subjects, of which 1,770 reported chronic pain and the others reported no chronic pain. We mailed a repeat questionnaire to these 2 groups in 2011, and obtained replies from 1,460 of those who had reported chronic pain (reply rate 82.5 %) and 4,797 of those who did not have chronic pain (reply rate 76 %) at the time of the 2010 survey. Besides such basic information as gender, age, location of residence, and occupation, our questionnaire asked about the severity, location, and duration of chronic musculoskeletal pain, whether the pain was treated, and about the facility where treatment was received, the nature of the treatment, the treatment period and effectiveness, and the patient's degree of satisfaction. In both the 2010 and 2011 surveys, musculoskeletal pain was defined as pain associated with bone, muscle, joints, or nerves at each of 11 anatomical sites (neck, back, low back, shoulder, elbow, wrist/hand, arm, hip, knee, ankle/foot and leg) (Fig. 1), and chronic pain was also defined as pain experienced at least once in the past 30 days, with a severity score of 5 or more on a visual analogue scale (VAS), and persisting for 6 months or more. We calculated the incidence rate of new chronic pain based on the 4,797 persons who did not have chronic pain in fiscal 2010, and the chronic pain persistence rate based on the 1,460 persons who had reported chronic pain in fiscal 2010. Incidence rates and persistence rates were

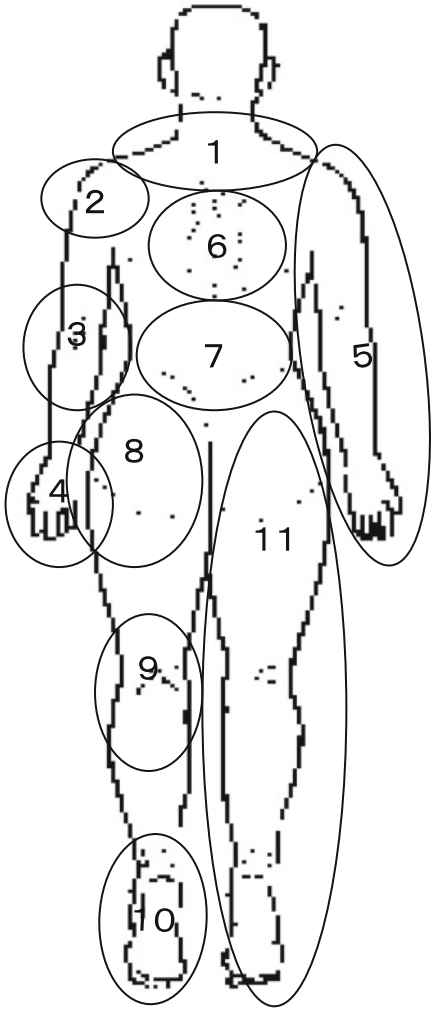

Fig. 1 The full-body manikin used in the pain-associated epidemiological survey. *1* neck, *2* shoulder, *3* elbow, *4* wrist/hand, *5* arm, *6* back, *7* low back, *8* hip, *9* knee, *10* ankle/foot, *11* leg

calculated according to the individual factors such as gender, area of residence, and urban size, and occurrence rates were compared by the χ^2 test. In addition to gender and age, significantly associated factors identified by the crude odds ratio ($p < 0.1$) were ultimately included in multivariate analysis (logistic regression analysis), and adjusted odds ratios were calculated. Factors for which the crude odds ratio did not find an association were also incorporated into the final model, one by one, to check their effect.

We evaluated the treatment circumstances in detail for respondents who reported persistent chronic pain, including whether the pain was treated, the type of treating facility, the nature and effectiveness of the treatment, the subject's degree of satisfaction, and whether the patient changed treatment facilities. This study was approved by the IRB of Keio University.

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