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Original article

Patient characteristics in low back pain subgroups based on an existing classification system. A descriptive cohort study in chiropractic practice

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ABSTRACT

Sub-grouping of low back pain (LBP) is believed to improve prediction of prognosis and treatment effects. The objectives of this study were: (1) to examine whether chiropractic patients could be sub-grouped according to an existing pathoanatomically-based classification system, (2) to describe patient characteristics within each subgroup, and (3) to determine the proportion of patients in whom clinicians considered the classification to be unchanged after approximately 10 days. A cohort of 923 LBP patients was included during their first consultation. Patients completed an extensive questionnaire and were examined according to a standardised protocol. Based on the clinical examination, patients were classified into diagnostic subgroups. After approximately 10 days, chiropractors reported whether they considered the subgroup had changed. The most frequent subgroups were reducible and partly reducible disc syndromes followed by facet joint pain, dysfunction and sacroiliac (SI)-joint pain. Classification was inconclusive in 5% of the patients. Differences in pain, activity limitation, and psychological factors were small across subgroups. Within 10 days, 82% were reported to belong to the same subgroup as at the first visit. In conclusion, LBP patients could be classified according to a standardised protocol, and chiropractors considered most patient classifications to be unchanged within 10 days. Differences in patient characteristics between subgroups were very small, and the clinical relevance of the classification system should be investigated by testing its value as a prognostic factor or a treatment effect modifier. It is recommended that this classification system be combined with psychological and social factors if it is to be useful.

1. Introduction

Low back pain (LBP) is the cause of a high number of health care consultations, but provable treatment effects are modest and different treatments seem to have more or less the same effects (van Middelkoop et al., 2010; Rubinstein et al., 2011; Standaert et al., 2011). This has partly been attributed to the fact that randomised controlled trials often investigate the effect of a 'one size fits all' approach in which all patients with non-specific LBP have the same type of care, and it has been suggested that treatment effects may be improved by classification of non-specific LBP into homogeneous subgroups that can guide the choice of treatment (Leboeuf-Yde and Manniche, 2001; Kent and Keating, 2004; Hill et al., 2011).

In 1987, the biopsychosocial model was suggested as a theoretical framework for the treatment of LBP (Waddell, 1987) and in the absence of specific diagnoses with consequences for outcome, profiling patients on the basis of biological, psychological and social prognostic factors appears relevant (Hemingway et al., 2013). Prognostic research has identified a high number of factors associated with outcome in LBP, but no single prognostic factor has been identified that strongly affects outcome in itself (Kent and Keating, 2008; Chou and Shekelle, 2010). Potentially relevant factors, and perhaps especially biological factors, are under-investigated in high quality studies (Kent and Keating, 2008; Hancock et al., 2011).

To enhance the clinical usefulness of prognostic factors and treatment effect modifiers, a number of classification systems have been developed that combine such factors into predictive models or classification systems (Fairbank et al., 2011; Karayannis et al.,

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2012). A classification system developed by Petersen et al. was designed to subgroup LBP patients according to the most likely pathoanatomical diagnosis (Petersen et al., 2003). This system combines Mechanical Diagnosis and Therapy (MDT) (McKenzie and May, 2003) with tests for sacroiliac (SI)-joint pain, neurological signs, adverse neural tension tests, and non-organic signs. In that way, clinical findings are combined into classes that are potentially stronger biological components in a biopsychosocial model than single tests.

The reliability of Petersen et al.'s system was tested in two small cohorts where the inter-tester agreement was found to be acceptable for the largest classes (Petersen et al., 2004; Kongsted and Leboeuf-Yde, 2010), whereas the reliability for the smaller diagnostic classes is unknown. Further, preliminary results suggest that the classification system has some predictive capacity (Kongsted and Leboeuf-Yde, 2010). However, its ability to categorise patients with similar profiles into the same subgroup, including its value as a prognostic factor or treatment effect modifier, has yet to be proven.

As a basic step to explore the usefulness of the system developed by Petersen et al. and to investigate whether classification based on clinical findings results in classes that also differ on psychological and social factors, the objectives of this study were: (1) to examine whether chiropractic patients could be classified according to the classification system, (2) to describe patient characteristics within each subgroup, and (3) to determine the proportion of patients in whom clinicians considered the classification to be unchanged after approximately ten days.

2. Methods

Patients with LBP who attended a clinic in the research network of the Nordic Institute for Chiropractic and Clinical Biomechanics in Denmark were recruited during their first visit for the current episode. Participants completed a questionnaire at baseline and the chiropractors classified patients based on a standardised examination protocol. Approximately 10 days after the initial visit, the clinicians registered whether they considered the diagnostic class had changed since baseline. The chiropractors were free to plan treatment that they deemed appropriate. The project was approved by the Danish Data Protection Agency (J-no. 7840-1011743), and the local ethics committee declared that the study did not need ethics approval according to Danish rules (DNcoBR, 2011).

2.1. Setting

Thirty-six chiropractors from 17 clinics geographically spread across Denmark participated in the study. Prior to data collection, all clinicians participated in a one-day seminar covering the theory and practice of the examination protocol for the study. Particular focus was put on the MDT approach since this was the part of the protocol with which clinicians were the least familiar. After the seminar, clinicians were asked to practise the standardised examination and one of the authors (HE) visited all clinicians to train them in the execution of the project protocol. If a chiropractor did not seem conversant with the protocol, another visit was scheduled. Three chiropractors in one clinic withdrew from the project after this introduction because they found that the protocol differed too much from their usual clinical procedures. The clinical experience of the participating chiropractors varied from one to more than 20 years.

2.2. Study sample

The chiropractors were instructed to include patients consecutively in the project as they contacted the clinic. Patients were potential participants if they sought care because of LBP with or without leg pain, were aged 18–65 years, had access to a mobile phone and were able to use text messaging (because of follow-up procedures unrelated to the objectives of this study), and could read and understand Danish. Exclusion criteria were pregnancy, suspicion of inflammatory or pathological pain, acute referral to surgery, and having had more than one health care visit for LBP within the last three months. Prior to giving consent, oral and written information about the study procedures was delivered by the chiropractor or by a secretary.

2.3. Survey data

Patients who gave consent to participate completed a questionnaire in the reception area before being examined by the chiropractor. The questionnaire was returned to the secretary in a sealed envelope and posted to the research unit.

2.3.1. Socio-demographics

Socio-demographic factors were gender, age, physical work load (mainly sitting, sitting and walking, light physical work, hard physical work), and sick-leave (proportion reporting any days off work due to LBP within the previous month).

2.3.2. LBP characteristics

Pain items were duration of the current episode (0–2 weeks, 2–4 weeks, 1–3 months, >3 months), the number of previous episodes (0, 1–3, >3), the number of LBP days over the previous year (≤30 days, >30 days) (Hestbaek et al., 2003), LBP intensity (typical pain the previous week on a numeric rating scale (NRS) 0–10 (Dionne et al., 2008)), leg pain intensity (0–10 NRS typical pain last week), and leg pain (proportion with NRS >0). Activity limitation was measured using the Danish Roland Morris Disability Questionnaire (Albert et al., 2003) and summed as a proportional score (0–100) (Kent and Lauridsen, 2011).

2.3.3. Psychological factors

Depressive symptoms were measured by the Major Depression Inventory (0–50) (Bech et al., 2001), pain-related fear of movement by the Fear Avoidance Beliefs Questionnaire (FABQ-work (0–42)); FABQ-physical activity (0–24) (Waddell et al., 1993), and coping by means of a single item from the Orebro Pain Questionnaire (Linton and Boersma, 2003) ('Based on all the things you do to cope, or deal with your pain, on an average day, how much are you able to decrease it?' 0 = can't decrease it at all; 10 = can decrease it completely). FABQ-work was only asked of those who were working.

2.3.4. General health

Self-reported general health was measured by the EQ-5D VAS (0 = worst imaginable health state; 100 = best imaginable health state) (Rabin and de Charro, 2001).

2.4. Subgroup classification

The clinical examination included responses to repeated end-range movements (MDT testing), five pain provocation tests for SI-joint testing (Laslett, 2008), tests for adverse neural tension, Waddell's non-organic signs (Waddell et al., 1980), and a neurological examination including straight leg raise (SLR) and tests of muscle strength, sensation and deep tendon reflexes. In addition to the test procedures, the protocol contained questions aimed at identifying signs of spinal stenosis and facet joint pain (Petersen et al., 2003).

The examination findings were translated into diagnostic classes as suggested by Petersen et al., although in our study, we