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Does anterior trunk pain predict a different course of recovery in chronic low back pain?

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ABSTRACT

Patient characteristics associated with the course and severity of low back pain (LBP) and disability have been the focus of extensive research, however, known characteristics do not explain much of the variance in outcomes. The relationship between anterior trunk pain (ATP) and LBP has not been explored, though mechanisms for visceral referred pain have been described. Study objectives were: (1) determine prevalence of ATP in chronic LBP patients, (2) determine whether ATP is associated with increased pain and disability in these patients, and (3) evaluate whether ATP predicts the course of pain and disability in these patients. In this study, spinal outpatient department patients mapped the distribution of their pain and patients describing pain in their chest, abdomen or groin were classified with ATP. Generalized estimating equations were performed to investigate the relationship between ATP and LBP outcomes. A total of 2974 patients were included and 19.6% of patients reported ATP. At all time points, there were significant differences in absolute pain intensity and disability in those with ATP compared with those without. The presence of ATP did not affect the clinical course of LBP outcomes.

The results of this study suggest that patients who present with LBP and ATP have higher pain and disability levels than patients with localised LBP. Visceral referred pain mechanisms may help to explain some of this difference.

1. Introduction

Low back pain (LBP) continues to be a major global health problem and a leading cause of disability [27]. To better understand the complex nature of LBP and to identify potential targets for treatment, previous studies have investigated patient characteristics associated with the course and severity of LBP and associated disability. Factors identified to date include high baseline levels of pain and disability, older age, smoking, unemployment, poor general health, depression, anxiety, and widespread pain [2,7,10,13,25]. However, these factors explain only a relatively small proportion of the variance in outcomes [7].

One factor that has not been adequately explored is anterior trunk pain (ATP). Pain in the abdominal or pelvic regions can refer to the low back, through viscero-somatic referral mechanisms [6]. Gastrointestinal (GI) disorders have been shown to co-exist with LBP in large longitudinal studies [21,22]. For example, women who experience GI symptoms such as menstrual pain have a higher likelihood of developing LBP (odds ratio = 2.3–3.3), compared with women without GI symptoms, even when other health factors are controlled for [21]. A recent secondary analysis of the SPORT trial found that patient-reported "stomach problems" were the only factor, apart from duration of symptoms, associated with a higher lumbar spine reoperation rate [19]. Patients who underwent reoperation had "stomach problems" nearly twice as often as patients who did not undergo reoperation (35% vs. 19%).

It is possible that ATP simply presents as a component of widespread body pain, which may occur as a result of a peripheral and central sensitization processes [29]. A previous study found that

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31% of subjects with chronic LBP had widespread body pain [16] and several studies have reported poorer outcomes for subjects who had LBP and widespread body pain [2,3,7,10]. An alternative explanation is that ATP can be associated with LBP, independently of widespread pain distribution. To date, no studies have investigated the independent role of ATP as a contributor to LBP and associated disability.

A greater understanding of the prevalence of ATP, in persons with chronic LBP, and its possible role as a contributor to the multifactorial nature of LBP is required. Therefore, the aims of this study were as follows: (1) to determine the prevalence of ATP in patients presenting with chronic LBP; (2) to determine whether the presence of ATP is associated with increased pain and disability in persons with chronic LBP; and (3) to evaluate whether the presence of ATP predicts the course of pain and disability in persons with chronic LBP.

2. Methods

This study analyzed data from the SpineData database, which were collected as part of routine clinical practice in a secondary care, nonsurgical, outpatient, public hospital department in southern Denmark. The medical department principally performs multidisciplinary, structured clinical examination and treatment planning before subsequent referral back to primary care. Some patients are referred for other specialist review, and short courses of conservative treatment can be offered to test a patient's response to treatment. In this study, at the initial consultation and before clinical assessment, patients completed an electronic questionnaire on a touch screen that was linked to the facility's electronic registry, the SpineData database.

Patients were invited to complete a follow-up questionnaire 3 months and 12 months after their initial assessment. Further description of the clinical setting, questionnaires used, and data collection process have been described previously [14]. Only patients who gave informed consent for their data to be used for scientific purposes were included in the study.

This study was approved by The Scientific Ethics Committee of the Region of Southern Denmark Project ID S-200112000-29.

2.1. Study population

All patients who presented to the Spine Centre with LBP as their primary complaint between February 28, 2011, and April 25, 2012, were eligible for inclusion. After 6 weeks of primary care for an episode of LBP, patients in the geographical catchment area have a right to be referred to the Spine Centre if the clinical course is not progressing satisfactorily. Primary care clinicians decided whether to refer patients to the surgical department or to the medical department, and only those patients referred to the medical department were included in this study. Participants were excluded if they reported their LBP to be pregnancy related, failed to complete the pain drawings at baseline, did not give informed consent, or did not complete either of the follow-up questionnaires. If a participant had more than 1 episode of care during the study period, only the first episode was included.

2.2. Baseline characteristics

2.2.1. Anterior trunk pain

The presence of ATP was assessed and coded as follows. Patients were asked to "Indicate where your pain is by drawing over the area with your finger" on a touch screen body chart, which recorded their symptom distribution. Next, participants were asked, "Over the last 2 weeks, have you been bothered by pain in body parts other than you have marked on the previous drawing?" to ensure that no additional painful regions were missed. If they answered "Yes," an identical second body chart was shown, and patients were prompted to record other areas of pain. On the anterior side of the body chart, the trunk was divided into the following regions: left and right chest, left and right stomach, and left and right groin. Participants who filled in any of these areas, on either the first or second body chart, were deemed to have ATP.

2.2.2. Covariates

Baseline variables collected and used as covariates in this study included the following: depressive symptoms (measured with the 2 Prime-MD 1000 screening questions [24]) using validated thresholds on numeric rating scale of 0 to 10) [12]; self-reported general health (measured with the EuroQOL health thermometer (EuroQOL visual analogue scale [VAS], where 0 = worst imaginable and 100 = best imaginable) [18]); smoking history (measured on a 6-point categorical scale where 0 = no smoking and 6 = 25 or more cigarettes per day); anxiety (measured with a dichotomous single item screening question "Do you feel anxious?" (0–10 numerical rating scale) [12]; and the presence of widespread body pain (defined as pain in upper and lower extremities and right and left extremities on the 2 combined pain charts, adapted from the American College of Rheumatology definition [28]). The screening questionnaires used for depression and anxiety were short versions of the validated long-form questionnaires [9,24]. These short versions have shown strong concurrent validity when compared with the long-form questionnaires [12].

2.3. Outcome measures

Pain severity was measured as the average mean of three 11-point numeric pain rating scales (NPRS, where 0 = no pain and 10 = worst imaginable pain) [17] that assessed the worst pain and usual pain over the last 2 weeks as well as the pain intensity at the present time [15]. Self-reported disability was measured with the 23-item Roland-Morris Disability Questionnaire (RMDQ) converted to a score of 100 (where 0% = no activity limitation and 100% = maximum activity limitation [11]). Outcomes were measured at baseline, 3 months, and 12 months [20].

2.4. Data analyses

Data analyses were performed using STATA/SE 12.1 and SPSS 16.0 (IBM Corp., Armonk, NY). Dichotomous baseline characteristics were calculated as percentages, and continuous variables were presented as means with standard deviations (SD).

Generalized estimating equations (GEE) (family Gaussian, link identity) were performed to investigate the longitudinal relationship between ATP and LBP outcomes (pain and disability). This GEE approach models population-averaged linear regression for panel data and takes into account that repeated measures are available from each participant. The same procedures were followed for the outcomes of pain intensity and disability. First, a simple model including only ATP, time, and the interaction between anterior pain and time was investigated. Second, we investigated whether the observed association was still present after forcing all of the covariates (age, gender, smoking, general health, anxiety, depression, widespread body pain, pain duration) into the model. For the model with pain as the outcome, activity limitation was also included as a covariate, and LBP intensity was included in the model with activity limitation as the outcome. The amount of variance in the outcomes explained by ATP was assessed by comparing the explained variance (calculated from scale parameters) from the multivariable longitudinal model without variables for