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The Spine Journal 16 (2016) 16–22

THE SPINE JOURNAL

Clinical Study

The importance of identifying and modifying unemployment predictor variables in the evolution of a novel model of care for low back pain in the general population

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Received 19 February 2015; revised 13 July 2015; accepted 14 September 2015

Abstract

BACKGROUND CONTEXT: Care for low back pain (LBP) is costly, fragmented and, in non-compensation populations, rarely specifically addresses factors associated with maintaining employment status or return to work (RTW).

PURPOSE: This study aimed to identify modifiable independent risk factors for (1) a negative work status at presentation and (2) a change in work status during treatment in a cohort of LBP patients. The results are intended to inform improvement in best-evidence care pathways to maximize societal outcomes and overall value of a new model of care.

STUDY DESIGN/SETTING: A prospective observational study was carried out. Inclusion criteria: Work-eligible, non-workers compensation patients with recurrent or persistent LBP ≥6 weeks and ≤12 months. Setting: The Inter-professional Spine Assessment and Education Clinics (ISAEC)—a novel Government-funded shared-care model of management for LBP.

METHODS: This study used the following methods: (1) Cross-sectional analysis of baseline data from the initial ISAEC consultation (t_0) from December 2012 to April 2014. Work status at t_0 was dichotomized as employed (E) or underemployed (UE; unemployed, modified work duty, or disability). Multivariate logistic regression modeling was used to determine independent predictors of UE status at t_0. (2) Bivariate analysis of longitudinal data from t_0 to 6 months (t_1) to identify risk factors for work status change. Employment journey categorized into four groups: Et_0/Et_1—employed at t_0 and employed at t_1; Et_0/UEt_1—employed at t_0 and underemployed at t_1; UEt_0/Et_1—underemployed at t_0 and employed at t_1; UEt_0/UEt_1—underemployed at t_0 and underemployed at t_1.

RESULTS: This study yielded the following results: (1) Initial consultation data on 462 consecutive patients (Et_0=344, UEt_0=118). Multivariate logistic regression identified legal claim, depression, smoking, and higher STarT Back (or Oswestry Disability Index [ODI]) score as independent risk factors for UEt_0. (2) Overall UE rate did not significantly change during longitudinal analysis (n=178, UEt_0=25.5%, UEt_1=22.9%). However, 10.5% of Et_0 became UEt_1 (Et_0/Et_1=102, Et_0/UEt_1=12). Bivariate analysis identified elevated baseline ODI score as the only significant predictor variable for UEt_1 in Et_0 cohort (p=.0101). Conversely, ISAEC improved the employment status in 41% of UEt_0 to Et_1 (UEt_0/Et_1=16, UEt_0/UEt_1=23), and the absence of depression was significant for predicting RTW (p=.0001).

FDA device/drug status: Not applicable.

Author disclosures: ***SAH:*** Nothing to disclose. ***YRR:*** Consulting: Medtronic (D, Paid directly to author).

The disclosure key can be found on the Table of Contents and at www.TheSpineJournalOnline.com.

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http://dx.doi.org/10.1016/j.spinee.2015.09.034

CONCLUSIONS: From a societal perspective, employment status as an outcome measure is paramount in assessing the value of a new model of care for LBP. Mitigation strategies for the predictor variables identified will be included in ISAEC pathways to translate clinical improvement into societal added value.

Keywords: Depression; Employment; Low back pain; Model of care; Smoking; Value

Introduction

The global burden of low back pain (LBP) has a median 1-year prevalence of over 40% of the adult population [1]. It is estimated that 25% of LBP patients account for 75% of the societal cost with employment-productivity losses representing the majority of that cost [2–5]. As a chronic disease, LBP has an annual estimated total and incremental health-care expenditure in the United States in excess of US$90 billion and US$26 billion, respectively [3]. Furthermore, it is estimated that LBP causes approximately 149 million lost workdays annually in the United States [6]. An increasing evidence base has demonstrated that LBP is a complex multidimensional problem with a high risk of developing chronicity behavioral changes [7,8]. This is further supported by basic science confirmation that chronic LBP can become patho-anatomically different from acute LBP. For example, chronic pain research has identified reversible changes of decreased gray matter density in regions of the brain that function as multi-integrative structures during the experience and anticipation of pain [9–12].

However, despite these incredible costs and the complex nature of the disease, unlike other chronic diseases such as diabetes mellitus [13], asthma [14], and chronic obstructive pulmonary disease [15], there are no well-established care programs to address the complex interaction of pain, disability, and psychosocial functioning that is often associated with LBP.

The Inter-professional Spine Assessment and Education Clinics (ISAEC) was established in Ontario in 2012 and funded by the Ontario Ministry of Health and Long-Term Care as a pilot shared-care model of management aimed at integrating the current fragmented care for LBP [16]. Integrated primary care physicians (PCPs) refer LBP patients with unmanageable symptoms of greater than 6 weeks to ISAEC for a multidisciplinary assessment (advanced care practitioners [physiotherapist and chiropractors]) where they receive a comprehensive assessment with multidimensional risk stratification and patient-specific education, facilitated self-management of their LBP, and a shared-care management plan. Where necessary, further specialist referral is facilitated through networked providers. There are four overarching objectives of the ISAEC model of care: (1) improve outcomes and satisfaction with health-care delivery for patients with persistent or unmanageable recurrent LBP-related symptoms; (2) reduce chronicity of LBP; (3) decrease utilization of lumbar spine magnetic resonance imaging; and (4) reduce unnecessary referrals to LBP-related specialists. The broader ISAEC goal was to inform a province-wide rollout of a model of care for all musculoskeletal conditions.

Comparison of data in studies on LBP is impeded because of the heterogeneous study population and multiple methods of outcome assessment [17]. The overwhelming majority of non-occupational sourced scientific literature on the management of LBP focuses on patient benefit, in terms of improvement in pain and disability. However, from a system-design perspective, all value drivers need to be considered to address multiple stakeholder requirements that enable successful implementation and sustainability of a model of care. Employment status is the value driver with the largest cost-coefficient, and it is therefore essential to critically assess impact of a model of care on employment status.

The primary objective of the study was to identify modifiable independent risk factors for a negative work status in a non-workers compensation cohort of LBP patients presenting to ISAEC. Secondarily, we explored preliminary longitudinal data to identify modifiable factors that may contribute to a *change* in work status during a 6-month course of treatment. The results are intended to inform improvement in best-evidence care pathways to maximize societal outcomes and overall value of the ISAEC model of care.

Materials and methods

Inclusion criteria for triggering an ISAEC assessment include patients with unmanageable recurrent LBP or persistent LBP of duration greater than 6 weeks and less than 12 months. Exclusion criteria include patients with red flag symptoms, an established pain disorder, established narcotic dependency, and pregnant or postpartum less than 1 year. Data from patients enrolled into an ongoing prospective observational study were assessed. Patients completed a comprehensive intake data form including documentation of pain and neurologic history, analgesia use, employment status, functional limitations, allied health utilization, investigations completed, comorbidities, drug or allergy or smoking history, Oswestry Disability Index (ODI) [18], EuroQol-5D [19], Connor–Davidson Resilience Scale 2 [20], self-efficacy of managing chronic disease questionnaire, and the STarT Back tool [7]. Patients were assessed by an advance care practitioner (physiotherapist or chiropractor) who had received specific training in LBP assessment and management for the purpose of ISAEC. Dominant presenting pain patterns were classified by type [21]: P1—Back dominant pain aggravated by flexion; P2—Back dominant pain aggravated by extension; P3—Constant leg dominant pain; P4—Intermittent leg dominant pain. Management plans were developed based on presenting pain pattern, and for those with high chronicity