One-year trajectories of low back-related leg pain in primary care patients: analysis using growth mixture modelling

Reuben Ogollah, Kate M. Dunn, Siobhán Stynes and Kika Konstantinou
Research Institute of Primary Care and Health Sciences, Keele University, Staffordshire, UK

Background: The clinical presentations and outcomes of patients with back and leg pain in primary care are very heterogeneous and may be better understood by the recognition of clinically meaningful subgroups through identification of their clinical course patterns. While many studies have identified trajectories of patients with back pain and their characteristics, little is known about the temporal evolution of pain severity for patients with back and leg pain. This study sought to identify distinct leg pain trajectory groups and baseline patient characteristics associated with the membership of each cluster in primary care patients.

Methods: Monthly data for leg pain intensity were collected over 12 months for 609 patients participating in a prospective cohort study of patients ≥18 years of age seeking health care for low back and leg pain, including sciatica (the ATLAS study). Growth mixture modelling was used to explore the course of leg pain and identify clusters of patients with distinct trajectories of symptoms over 12 months of follow-up. Trajectories were characterized using information on baseline demographic and clinical factors. Multinomial logistic regression was used to predict latent class membership with a range of covariates.

Results: The growth mixture model determined four clusters with different leg pain trajectories over 12 months: (i) improving mild pain [n = 352 (57.8%)], (ii) persistent moderate pain [n = 161 (26.4%)], (iii) improving severe pain [n = 17 (2.8%)] and (iv) persistent severe pain [n = 79 (13.0%)]. Cluster 1 patients, on average, started with mild pain, improving rapidly to no pain within 3 months. Cluster 2 patients started with moderate pain that persisted over the year. Cluster 3 patients started with severe pain that reduced gradually within 5 months, then rapidly to no pain, and were on average older and almost all clinically diagnosed with sciatica. Cluster 4 patients had persistent severe pain (mean > 7). Both cluster 3 and 4 had higher levels of disability, anxiety, depression and sciatica bothersomeness than other clusters. Clusters showed statistically significant differences in baseline age, disability, sleep disturbance, anxiety, depression, being in full-time work, leg pain duration, leg pain being worse than back pain, sciatica clinical diagnosis, evidence of nerve root compression on MRI and whether referred to secondary care.

Conclusion: Four trajectories of leg pain over 12 months were identified, with the majority of patients following stable patterns, not fluctuating over time. Clusters 1 and 4 were generally comparable to back pain trajectories, while cluster 3, with major improvement in pain, is less often found among back pain patients. Although our results may be hampered by non-response, a sensitivity analysis with patients having complete data gave similar results. Identification of such distinct groups of patients improves our understanding of the course of leg pain and may provide a basis for classification for intervention.

Disclosure statement: S.S. has received research funding from the NIHR/Chief Nursing Officer Clinical Doctoral Research Fellowship (CDRF-2010-055). K.K. has received research funding from the Higher Education Funding Council for England/NIHR Senior Clinical Lectureship. All other authors have declared no conflicts of interest.