Can Psychosocial Screening Predict the Transition to Chronic Pain 6 Months After Lower-Extremity Trauma?

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Purpose: Approximately 200,000 Americans who sustain a lower-extremity fracture (LEF) requiring surgical fixation develop chronic pain each year. It is well described that psychosocial characteristics can drive poor outcomes. However, no studies have determined if psychosocial factors can predict the development of chronic pain. The purpose of this study was to determine whether early psychosocial screening can predict chronic pain and pain severity at 6 months. We hypothesized that high pain catastrophizing, fear of movement, and low pain self-efficacy are associated with the development of chronic pain in operative orthopaedic trauma patients with LEF.

Methods: 57 subjects with LEFs requiring operative intervention and without a past history of chronic pain (age 47.3 ± 15.5 years) were recruited from a Level-I trauma center. Pain catastrophizing (Pain Catastrophizing Scale [PCS]), pain self-efficacy (PSEQ [Pain Self-Efficacy Questionnaire]), and fear of movement (TSK [Tampa Scale for Kinesiophobia]) were assessed 1 week, 6 weeks, 3 months, and 6 months after fixation. At 6 months we recorded pain intensity and chronic pain, defined by the National Institutes of Health as reporting pain as an ongoing problem over the last 4-6 months and the pain as bothersome at least half the days over the last 6 months. Changes in psychosocial scores at each time point were compared via a 2 x 4 analysis of variance. Odds ratios for adverse 6-month pain outcomes were calculated.

Results: Patients who reported chronic pain at 6 months had elevated PCS, PSEQ, and TSK scores at each time point compared to the group without chronic pain. Individual psychosocial profiles changed significantly between 1 and 6 weeks ($P < 0.001$), and remain stable between 6 weeks and 3 months ($P = 1.0$) indicating 6 weeks as the optimal time frame to screen patients. Individuals with a 6-week PCS ≥12 were 6.3 times more likely to develop chronic pain at 6 months (odds ratio [OR]: 6.3; 95% CI [confidence interval]: 1.6-25.5, $P < 0.01$) and 11.0 times more likely to report severe pain intensity at 6 months (OR: 11.0; 95% CI: 2.4-49.8, $P < 0.01$). Subjects with a 6-week PSEQ ≤40 were 20.7 times more likely to report severe pain intensity at 6 months (OR: 20.7; 95% CI: 2.4-176.7, $P < 0.01$). Finally, subjects with a TSK ≥42 at 6 weeks were 10.6 times more likely to develop chronic pain at 6 months (OR: 10.6; 95% CI: 2.6-43.0, $P < 0.01$).

Conclusion: Chronic pain after LEF is common. Early identification of patients at risk for chronic pain is paramount. Our results demonstrate that low self-efficacy, high pain catastrophizing, and high fear of movement 6 weeks after surgical fixation are predictive of chronic pain. Physicians can utilize these short screening tools early in recovery to develop meaningful interventions to prevent chronic pain in patients with LEF.