Depression in Orthopaedic Trauma Patients: A Prospective Cohort

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Background/Purpose: Orthopaedic trauma patients often have psychiatric comorbities that are either not diagnosed or under treated. Depression may affect the outcome of a patient's recovery in a variety of ways but longitudinal effects in orthopaedic trauma are yet fully described. This study prospectively followed a cohort of orthopaedic trauma patients with the purpose of building a predictive model to identify risk factors contributing to depression in patients with skeletal injuries. We hypothesized that more severe injuries would correlate with higher levels of depression.

Methods: After IRB approval, orthopaedic trauma patients underwent both a PHQ-9 (Patient Health Questionnaire) for depression and the Duke Social Support and Stress Scale (DUSOCS). Demographic data, history of psychiatric conditions, and injury patterns were obtained from the medical record. Patients were called at 9 months to follow their PHQ-9 score, DUSOCS score, any psychiatric treatment, and work and insurance status. c^2 tests were used to determine any risk factors for depression at injury and 9-month follow-up. A Pearson correlation coefficient was calculated between DUSOCS and PHQ-9 scores. Analysis of variance was used to compare the mean change of PHQ-9 score between the initial injury and follow-up. Predictive models for PHQ-9 score at injury were built withholding a subset of patients to test the model on.

Results: 110 patients were enrolled at injury, of whom 22 had moderate to major depression and 36 had mild depression. 47 patients were able to complete the required surveys at an average of 9 months follow-up. Factors with significance for mild depression (PHQ-9 >4) at the time of injury were a history of illegal drug use ($P = 0.037$) and DUSOCS support score ($P = 0.002$), which had a negative Pearson correlation coefficient with PHQ-9 (n = –0.18, $P = 0.03$). Factors with significance for moderate to major depression (PHQ-9 >9) at time of injury were a history of a psychiatric diagnosis ($P = 0.0009$) and work status at injury ($P = 0.039$). Both a history of psychiatric diagnosis and an elevated PHQ-9 score were predictors of having depression at 9 months ($P = 0.02$ and $P = 0.0005$ respectively). Having Medicaid insurance was significant for an increase in depression score at 9 months ($P = 0.02$). The most successful predictive model built was as follows:

Predicted PHQ-9 score = $5.69 + 3.63(P_H) - 1.24(W_S) + 0.95(G_S)$
P_H is 1 if the psychiatric history is positive and 0 if negative.
W_S is 1 if the patient is employed at time of injury and 0 if unemployed.
G_S is 1 if the patient required a general surgical procedure and 0 if not.

Conclusion: Depression was quite prevalent in our patient cohort. A prior psychiatric diagnosis predisposed patients to depression. Socioeconomic status is also a predictive factor for increased depression scores at 9 months. A higher feeling of support from friends and family has an inverse correlation with depression. Employment appears to have a protective effect. The severity of injury did not affect depression. The predictive model identified the existence of a psychiatric, unemployment, and a general surgical procedure as risk factors for the longitudinal perseverance or worsening of depression. To our knowledge it is the first study to longitudinally study and build a predictive model for the evolution of depression in orthopaedic trauma patients.

See pages 99 - 147 for financial disclosure information.

POSTER ABSTRACTS