

Determining Patterns of Symptomatic Osteoarthritis Progression

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Summary:

Our data show that patients can be successfully grouped by patterns of symptomatic OA progression, and that both patient-reported outcome and performance measures must be considered. Interestingly, some patients may have an improvement in patient-reported outcome while experiencing a worsening of functional performance, and vice versa.

Abstract:

Objectives:

The goal of the present study was to determine patterns of osteoarthritis (OA) progression while taking into account multiple patient-reported outcomes and performance measures.

Methods:

Data were taken from the progression subcohort of the Osteoarthritis Initiative. The Osteoarthritis Initiative (OAI) is a multi-center, four-year observational study focusing on OA incidence and progression. Nine outcome measures were selected from the OAI database for analysis. Patient-reported outcomes included four KOOS subscores and three WOMAC subscores. Performance measures included the 20-meter walk pace and chair stand pace. Analysis was completed in three steps. First, annual changes in outcome measures at baseline and years 1 - 3 were modeled using linear regression. Second, the slopes of the linear regressions were subjected to factor analysis. Third, patients were grouped using k-means cluster analysis of the resultant factors.

Results:

Factor analysis yielded two primary factors. Factor 1 tended to correlate with change (slope) in patient-reported outcomes (KOOS/WOMAC), whereas Factor 2 tended to correlate with change in performance measures. Six groups of patients were identified via k-means cluster analysis. The resulting clusters fell into 3 broad groups of patient-reported outcome change: two clusters improved, two clusters worsened and two clusters showed little-to-no change. Clusters with similar patterns of patient-reported symptomatic change showed differences in trends for performance measures.

Conclusions:

Our data show that patients can be successfully grouped by patterns of symptomatic OA progression, and that both patient-reported outcome and performance measures must be considered. Interestingly, some patients may have an improvement in patient-reported outcome while experiencing a worsening of functional performance, and vice versa. Future analysis of demographics, patient characteristics and imaging will hopefully allow development of models to predict which pattern of symptomatic progression individual patients will experience. Such information would be invaluable in guiding clinical decision-making for patients with osteoarthritis.