

Impact of Social Factors on Visual Analog Scale Pain in Patients With Spondyloarthritis: A Propensity Score Matching Analysis

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Abstract-

Objective

Pain in spondyloarthritis reflects not only inflammatory activity but also social context. We quantified the association between a composite Social Factors Index (SFI) and patient-reported pain severity on the Visual Analog Scale (VAS).

Methods

We analyzed 2,042 patients from REGISPONSER (N = 1,514) and RESPONDIA (N = 528). Missing data were handled with multiple imputation (m = 20). The SFI combined education, employment, housing, income source, and Graffar class using penalized regression (sparse-group lasso). Mutual information (MI) quantified the SFI's relative importance. Propensity scores (logistic regression) supported 1:1 caliper matching (0.2 SD on the logit), comparing the highest (Q4) and lowest (Q1) SFI quartiles.

Results

Before matching, Q1 and Q4 included on average 918 and 829 patients per imputation, differing mainly in race (White 80.8% vs 86.8%; standardized mean difference [SMD] = -0.16) and country (Spain 66.2% vs 78.2%; SMD = -0.27). After matching, a mean of 745 pairs (range 731–761) were retained with excellent covariate balance (all $|SMD| \leq 0.10$). In the matched sample, patients in Q4 reported higher pain (average treatment effect on the treated +0.38 VAS points; 95% confidence interval [CI] 0.05–0.71; $P = 0.023$). Postmatching regression yielded an identical estimate ($\beta = +0.37$; 95% CI 0.04–0.70; $P = 0.030$). MI indicated the SFI carried more information about VAS than any single social variable. Stratified analyses suggested heterogeneity: Spain +0.31 (95% CI 0.08–0.71) and Latin America +0.62 (95% CI -0.22 to 1.45).

Conclusion

Social disadvantage, summarized by the SFI, is independently associated with greater pain severity in spondyloarthritis after adjustment. These findings support incorporating social determinants into clinical assessment and pain management.

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