Predictors of Remission in Rheumatoid Arthritis Patients Treated with Biologics: A Systematic Review and Meta-Analysis

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Published: 05 May 2023

Introduction: Biologics have emerged as an effective treatment of rheumatoid arthritis (RA). However, there is a significant proportion of patients who fail to respond to biologics. Identifying the predictors that affect the response to biologics remains challenging.

Methods: A comprehensive literature search of PubMed, Embase, and Web of Science databases was conducted through May 01, 2022. We included all studies that used a multivariate model to assess for the predictors of remission in RA patients treated with biologics. We calculated pooled odds ratios (OR) with 95% confidence intervals (CI) for risk factors reported in ≥3 studies using a random-effects model.

Results: A total of 16,934 patients with RA who were treated with biologics were included in twenty-one studies. Our study showed that old age (OR 0.98 (0.97, 0.99), P <0.00001), female gender (OR 0.66 (0.56, 0.77), P <0.00001), smoking history (OR 0.86 (0.75, 0.99), P 0.04), obesity (OR 0.95 (0.91, 0.99), P 0.02), poor functional status (OR 0.62 (0.48, 1.27), P < 0.00001), high disease activity (OR 0.90 (0.85, 0.96), P 0.0005), and elevated ESR (OR 0.99 (0.98, 1.00), P 0.009) were poor predictors of remission. While positive Anti-citrullinated Protein Antibodies (OR 2.52 (1.53, 4.12), P 0.0003) was associated with high remission rate.

Conclusion: Old age, female gender, obesity, smoking history, poor functional status, high disease activity, and elevated ESR at the time of diagnosis have been associated with poor response to biologics. Our findings could help establish a risk stratification model for predicting the remission rate in RA patients receiving biologics.