

Bayesian Analysis of Factors Associated with Romosozumab Adherence Among Early Adopters in Medicare Beneficiaries

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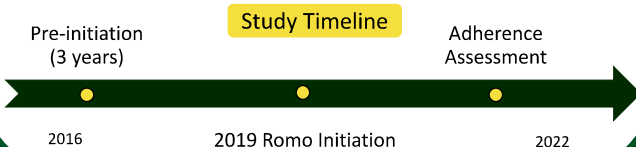
Background

Understanding adherence among early adopters of newly licensed drugs is crucial for management, but small study populations pose challenges. Romosozumab (Romo), approved in the U.S. in April 2019, is a parenteral osteoporosis (OP) treatment for postmenopausal women at high fracture risk. This study used Bayesian methods to explore factors associated with Romo adherence among its early adopters. This study is to identify factors associated with Romo adherence using Bayesian regression.

Methods

Based on prior research, we stratified the analyses by age (younger: ≤ 75 ; older: > 75 years), and selected adherence predictors including race, geographic region, metropolitan residence (MR), Charlson Comorbidity Index (CCI), chronic kidney disease (CKD), COPD, antidepressant use (anti-DP), antidiabetics (anti-DM), hormone therapy (HT), steroids, and ER visits.

Prior information of predictors was derived from previous literature. High Romo adherence was defined as proportional days covered (PDC) $\geq 80\%$ over 3 months. Frequentist and Bayesian logistic regression models were evaluated Bayesian models reported odds ratios (ORs) with 95% credible intervals (CrI).

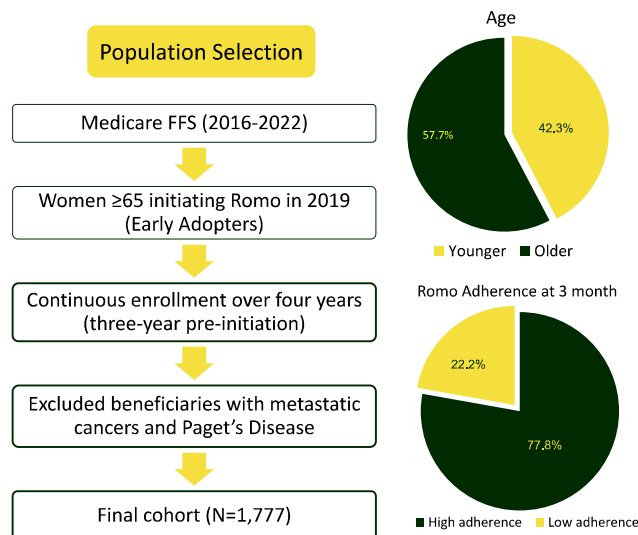


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Results



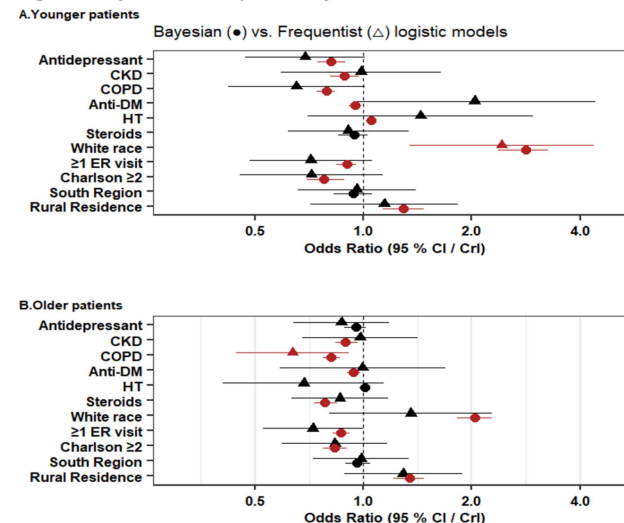
Frequentist analysis linked White race to higher adherence in younger women (OR 2.42, 95%CI [1.35–4.36]) and COPD to lower adherence in older women (0.64, [0.44–0.91]).

Bayesian analysis revealed additional associations. In younger patients, anti-DP (OR=0.81, 95% CrI: [0.74–0.89]), CKD (0.88 [0.81–0.97]), COPD (0.79 [0.74–0.83]), anti-DM (0.95 [0.91–0.99]), ER visits (0.90 [0.84–0.96]), and higher CCI (0.78 [0.70–0.88]) were associated with decreased adherence, while White race (2.83 [2.37–3.26]), MR (1.29 [1.13–1.47]) and HT (1.05 [1.01–1.09]) were associated with high adherence.

In older patients, CKD (0.89 [0.84–0.96]), COPD (0.81 [0.77–0.86]), steroids (0.78 [0.73–0.85]), and higher CCI (0.83 [0.77–0.90]) were associated with decreased adherence, while White race (2.05 [1.82–2.28]) and MR (1.34 [1.22–1.48]) were associated with high adherence (shown in Figure 1).

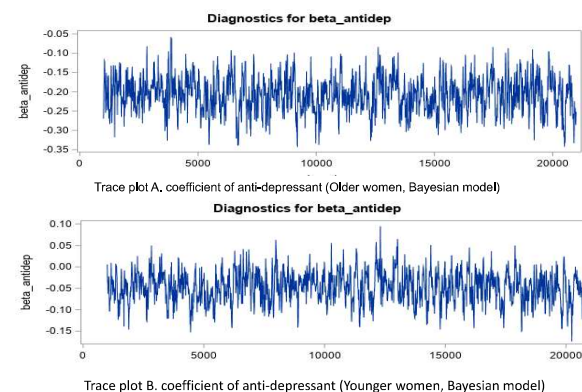
Results (Cont.)

Figure 1. Bayesian vs. Frequentist adjusted odds ratios for 3-month PDC



Model: ● Bayesian, △ Frequentist

Notes: PDC: proportion of days covered; CKD: chronic kidney disease; COPD: Chronic Obstructive Pulmonary Disease; ER: emergency room; HT: Hormone Therapy; CrI: confidence interval; CrI: credit interval



Conclusion

- Bayesian analysis identified additional adherence factors among early Romo adopters compared with frequentist models, including anti-DP and HT.
- Future research should consider Bayesian modeling when studying medication adherence, particularly when sample size may be limited.