Reviewer’s report

Title: Predictors of biologic-free disease control in patients with rheumatoid arthritis after stopping tumor necrosis factor inhibitor treatment

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Reviewer: Veena Ranganath

Reviewer's report:

The manuscript entitled "Predictors of biologic-free disease control in patients with rheumatoid arthritis after stopping tumor necrosis factor inhibitor treatment" by Giti Moghadam and colleagues is based on an interesting cohort that has been previously published off of in at least 5 other papers. Each of the variables described as independently predicting disease control after TNFi discontinuation have been described prior (disease duration, low/moderate MBDA (whole paper dedicated to this)), except for antibody type TNFi. In addition, the prediction model proposed can be improved on.

Minor- page 5 line 124, "We used date…” most likely should be changed to "We used data…”

p.5 line 130- The inclusion criteria for the study is rather loose, only requiring 6mos in LDA and/or rheumatologists opinion. And, the cutpoint of MBDA of 44 used in the models is also rather loose, since this describes low disease activity or remission. Why wasn't MBDA remission cutpoint used? In addition, what % of patients were on prednisone at baseline in the withdrawal group? These patients should be eliminated from the cohort, since in clinical practice, prednisone would be the first medication to discontinue not the TNFi.

p.5- please clearly define antibody type TNFi in the methods section, what was the considered reference variable.

p.7 line 182- Instead of using the Nagelkerke's pseudo R2 to examine the model strength it is typical to evaluate by the area under the ROC curve to summarize the model if the goal is to predict the outcome. In addition, there were only a few patients with missing baseline values (N=38), thus it is not clear what the advantage of utilizing multiple imputations is. It would probably be better to use the data available- especially when performing a prediction modeling exercise.

p.10 Table 2- Which was the reference for the Type of TNFi? Antibody or Receptor agonist? This is not clearly stated.

Would suggest that the authors provide logistic regression model with predictors that are continuous (ie MBDA, disease duration, etc) rather than utilizing arbitrary cutpoints.
What is the added value of MBDA as a predictor? This answer hasn't been fully considered. Suggest building model with MBDA and without it in the model. Would compare AUC with MBDA and without it.

Also, evaluating radiographic progression as an outcome would be of value. Perhaps "RA flare" as defined may not truly delineate a RA flare, but perhaps a fibro or OA flare. Would be of interest to know the type of patient who doesn't have radiographic progression, but may still have flares?

Why wasn't the ultrasound data also evaluated in this analysis?

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

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