AB0209

PREDICTORS OF ACHIEVING STRINGENT REMISSION IN PATIENTS WITH ESTABLISHED RHEUMATOID ARTHRITIS IN CLINICAL REMISSION FOLLOWING A TREAT-TO-TARGET STRATEGY

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Background: Achieving remission according to stringent criteria such as Simplified Disease Activity Index (SDAI) and ACR/EULAR Boolean remission is associated with a better long-term outcome in patients with RA¹. Possible predictors of achieving stringent remission in patients in clinical remission, following targeted treatment strategies, have not been investigated.

Objectives: To investigate the predictive value of clinical, radiographic and MRI variables on achieving more stringent remission in RA patients in clinical remission, following MRI and conventional treat-to-target (T2T) strategies.

Methods: In this post-hoc study, data were used from 171 RA patients in clinical remission (DAS28-CRP < 3.2 and no swollen joints) on conventional synthetic DMARDs, included in the IMAGINE-RA randomized clinical trial², where they followed an MRI T2T strategy (targeting absence of osteitis) combined with clinical remission (DAS28-CRP ≤ 3.2 and no swollen joints) or a conventional T2T strategy (targeting clinical remission only). Baseline contrast-enhanced MRIs of the dominant wrist and 2nd-5th MCP joints and radiographs of hands and feet were evaluated according to the OMERACT RAMRIS scoring system and Sharp/van der Heijde method, respectively, by two experienced readers. Potential clinical, radiographic and MRI baseline predictors of remission were first tested in univariate logistic regression analyses with achievement of Clinical Disease Activity Index (CDAI), SDAI, and ACR/EULAR Boolean remission at 24 months as dependent variables. Variables with p < 0.25 were subsequently tested in multivariate logistic regression analyses with backward selection, adjusted for age, gender and strategy group. Missing values of covariates were imputed using chained equations.

Results: Based on the univariate analyses, tender joint count, patient VAS global, VAS pain, VAS fatigue, physician VAS global, HAQ, MRI osteitis, radiographic and MRI erosion and joint space narrowing scores were included in multivariate analyses (Table).

Following the MRI T2T strategy was a positive predictor and high patient VAS global a negative predictor of achieving all definitions of remission. Furthermore, high patient VAS pain was negatively associated with achieving SDAI and ACR/EULAR Boolean remission and high tender joint count negatively associated with achieving CDAI and SDAI remission.

Multivariate logistic regression analyses with backward selection, final models

	Dependent variables, remission at 24 months								
	CDAI			SDAI			ACR/EULAR Boolean		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
Covariates									
MRI T2T strategy group	2.94	1.25-7.52	0.013	2.46	1.03-6.35	0.043	5.47	2.33-14.11	<0.001
Female	0.90	0.36-2.25	0.82	0.80	0.31-2.05	0.64	0.80	0.32-1.97	0.63
Age	1.02	0.98-1.07	0.32	1.02	0.98-1.07	0.33	1.03	0.99-1.07	0.15
Tender joint count (0-28)	0.33	0.12-0.86	0.023	0.29	0.10-0.78	0.013			
Patient VAS global	0.91	0.88-0.94	<0.001	0.93	0.88-0.97	<0.001	0.93	0.88-0.98	0.003
Patient VAS pain				0.95	0.91-1.00	0.049	0.92	0.87-0.98	0.004

Conclusion: In RA patients in clinical remission, poor patient reported outcomes and tender joint count were associated with decreased chance of achieving stringent remission, while following an MRI T2T strategy predicted stringent remission across all definitions thereof.

References:

- [1] Smolen et al. Ann Rheum Dis 2017
- [2] Møller-Bisgaard et al. JAMA 2019

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AB0210

ACREULAR: AN R PACKAGE FOR THE CALCULATION AND VISUALISATION OF ACR/EULAR RELATED RHEUMATOID ARTHRITIS MEASURES

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Background: The American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) individually and collaboratively have produced/recommended diagnostic classification, response and functional status criteria for a range of different rheumatic diseases. While there are a number of different resources available for performing these calculations individually, currently there are no tools available that we are aware of to easily calculate these values for whole patient cohorts.

Objectives: To develop a new software tool, which will enable both data analysts and also researchers and clinicians without programming skills to calculate ACR/EULAR related measures for a number of different rheumatic diseases.

Methods: Criteria that had been developed by ACR and/or EULAR that had been approved for the diagnostic classification, measurement of treatment response and functional status in patients with rheumatoid arthritis were identified. Methods were created using the R programming language to allow the calculation of these criteria, which were incorporated into an R package. Additionally, an R/Shiny web application was developed to enable the calculations to be performed via a web browser using data presented as CSV or Microsoft Excel files.

Results: acreular is a freely available, open source R package (downloadable from <https://github.com/fragla/acreular>) that facilitates the calculation of ACR/EULAR related RA measures for whole patient cohorts. Measures, such as the ACR/EULAR (2010) RA classification criteria, can be determined using precalculated values for each component (small/large joint counts, duration in days, normal/abnormal acute-phase reactants, negative/low/high serology classification) or by providing "raw" data (small/large joint counts, onset/assessment dates, ESR/CRP and CCP/RF laboratory values). Other measures, including EULAR response and ACR20/50/70 response, can also be calculated by providing the required information. The accompanying web application is included as part of the R package but is also externally hosted at <https://fragla.shinyapps.io/shiny-acreular>. This enables researchers and clinicians without any programming skills to easily calculate these measures by uploading either a Microsoft Excel or CSV file containing their data. Furthermore, the web application allows the incorporation of additional study covariates, enabling the automatic calculation of multigroup comparative statistics and the visualisation of the data through a number of different plots, both of which can be downloaded.

Figure 1. The Data tab following the upload of data. Criteria are calculated by the selecting the appropriate checkbox.

Figure 2. A density plot of DAS28 scores grouped by ACR/EULAR 2010 RA classification. Statistical analysis has been performed and shows a significant difference in DAS28 score between the two groups.

Conclusion: The acR/EULAR R package facilitates the easy calculation of ACR/EULAR RA related disease measures for whole patient cohorts. Calculations can be performed either from within R or by using the accompanying web application, which also enables the graphical visualisation of data and the calculation of comparative statistics. We plan to further develop the package by adding additional RA related criteria and by adding ACR/EULAR related measures for other rheumatic disorders.

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AB0211 DIFFERENTIAL INFLUENCE OF CDAI COMPONENTS BASED ON DISEASE STATE IN RHEUMATOID ARTHRITIS PATIENTS: REAL-WORLD RESULTS FROM THE ONTARIO BEST PRACTICES RESEARCH INITIATIVE (OBRI)

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Background: Treat-to-target recommendations for rheumatoid arthritis (RA) dictate that remission or low disease activity should be aimed. Although numerous composite indices are available, the clinical disease activity index (CDAI) is commonly used in routine clinical care due to its simplicity and non-reliance on acute phase reactants.

Objectives: The purpose of this analysis was to evaluate the CDAI properties both cross-sectionally and longitudinally in a cohort of RA patients followed in Canadian routine care.

Methods: RA patients enrolled in the Ontario Best Practices Research Initiative (OBRI), with available follow-up for ≥ 6 months and data on CDAI, disease activity score based on 28 joints (DAS28), health assessment questionnaire (HAQ), and ACR/EULAR Boolean remission were included. For both the CDAI score and its change from baseline to 6 months, construct validity was assessed with principal component analysis, internal consistency with the Cronbach's alpha coefficient (α), correlational validity with the Spearman's rho coefficient, agreement in disease state classification with percent concordant pairs and the kappa statistic. Stratified analysis by presence of CDAI low disease activity (LDA) or remission was performed.

Results: 1,582 patients met the inclusion criteria. Principal component analysis showed that CDAI could be reduced to a single component when CDAI is >10 with SJC28 accounting for most variance in score and patient global assessment (PtGA) the least; whereas, when CDAI is ≤ 10 , two distinct components were identified, the first comprising PtGA and physician global assessment (PhGA) and the second SJC28 and TJC28. In terms of internal consistency, high levels were observed for both CDAI at baseline ($\alpha=0.83$) and its change from baseline to 6 months ($\alpha=0.81$); however, the consistency between CDAI components was very low when CDAI is ≤ 10 ($\alpha=0.23$).

Overall, a strong positive correlation was observed between CDAI and DAS28 ($\rho=0.86$) and their changes ($\rho=0.87$) while its correlation with HAQ was weak. When stratifying by CDAI levels, the correlation of CDAI with DAS28 was moderate when CDAI is ≤ 10 and very weak when CDAI is ≤ 2.8 . Similarly, agreement in the classification of LDA between CDAI and DAS28 or HAQ was fair to moderate, and agreement in classification of remission was poor to fair.

Conclusion: CDAI and DAS28 correlate well when disease activity is moderate or high and poorly in LDA or remission. PtGA had a stronger influence on CDAI at LDA or remission state compared to moderate or high disease state. Thus, careful interpretation of PtGA is necessary particularly in patients who are identified as CDAI non-remitters.

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AB0212 FLARE RISK AFTER DISCONTINUING LONG-TERM METHOTREXATE TREATMENT IN PATIENTS HAVING RHEUMATOID ARTHRITIS WITH LOW DISEASE ACTIVITY

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Background: Several recent studies have reported that MTX could be discontinued in patients with low disease activity who are taking biologic DMARDs or tofacitinib. However, there are limited studies on whether MTX could be discontinued in patients with low disease activity who have taken MTX for a long term.

Objectives: We investigated the disease flare rate in patients with rheumatoid arthritis (RA) who achieved low disease activity following long-term methotrexate (MTX) treatment and the factors related to flare.

Methods: This retrospective longitudinal cohort study included patients with RA and low disease activity who were exposed to MTX for >10 years. Disease flare was defined as an increase in DAS28 of >1.2 within 6 months of discontinuation of MTX. Logistic regression analysis was performed to identify the factors associated with flare.