Objectives: High-titers of anti-cyclic citrullinated protein (anti-CCP) have been independently associated with reduced response to TNFi therapy;² thus, we evaluated the ability of a blood-based molecular signature response classifier (MSRC) test to stratify RA patients by their likelihood of inadequate response to TNFi therapies – regardless of their positive or negative anti-CCP status.

Methods: A subset of patients enrolled in the Network-04 prospective observational trial evaluating the ability of a molecular signature response classifier to stratify patients were subdivided into two groups based upon whether they were positive (N = 72) or negative (N = 74) for anti-CCP. The odds of inadequate response to TNFi therapies were calculated based on whether or not a patient had a molecular signature of non-response to TNFi therapy at baseline before the start of treatment. Odds ratios and confidence intervals were calculated^{3,4} to represent the strength of association between detecting the molecular signature of non-response and the patient's failure to achieve ACR50 at 6 months.

Results: The odds that a patient with a molecular signature of non-response failed to meet ACR50 criteria at 6 months was approximately three times greater than among those patients who lacked the signal (Table 1). No significant difference in odds ratios was observed between patients who were positive or negative for anti-CCP.

Table 1. The odds of patients with a molecular signature of non-response failing to achieve an ACR50 response 6 months after TNF inhibitor therapy initiation

	Odds ratio (95% confidence interval)
Anti-CCP positive	3.5 (1.3-9.7)
Anti-CCP negative	3.1 (1.2-8.3)

Conclusion: The MSRC test evaluates RA disease biology and accurately stratifies patients based on their likelihood of having an inadequate response to TNFi therapies, regardless of being negative or positive for anti-CCP autoantibodies. Rheumatologists can use the results of the MSRC test to inform targeted therapy selection for RA patients, instead of their anti-CCP serostatus, eliminating the variability inherent to the anti-CCP measurement and its inability to consistently predict TNFi therapy incompatibility. With the MSRC test, providers can rely on a more predictable and accurate assessment of TNFi therapy success or failure when coordinating patient management.

REFERENCES:

- [1] Mellors, T. et al. Clinical Validation of a Blood-Based Predictive Test for Stratification of Response to Tumor Necrosis Factor Inhibitor Therapies in Rheumatoid Arthritis Patients. *Network and Systems Medicine* 3, 91-104, doi:10.1089/nsm.2020.0007 (2020).
- [2] Braun-Moscovici, Y. et al. Anti-cyclic citrullinated protein antibodies as a predictor of response to anti-tumor necrosis factor- α therapy in patients with rheumatoid arthritis. *J Rheumatol* 33, 497-500 (2006).
- [3] Szumilas, M. Explaining odds ratios. *J Can Acad Child Adolesc Psychiatry* 19, 227-229 (2010).
- [4] Sperandei, S. Understanding logistic regression analysis. *Biochem Med (Zagreb)* 24, 12-18, doi:10.11613/BM.2014.003 (2014).

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AB0139 RHEUMATOID ARTHRITIS AND SLEEP QUALITY

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Background: Consequences of rheumatoid arthritis (RA) are many and varied: physical, psycho-affective and financial.

Objectives: The objective of our study is to evaluate the impact of RA on sleep quality.

Methods: We conducted a cross-sectional study including 49 RA patients. An evaluation of sleep quality using the MOS-Sleep Scale was performed.

Results: The mean age of patients was 54.1 years, with a female predominance (89.8%). The mean duration of RA was 11.43 $\pm$ 7.32 years with a mean time to diagnosis of 2.35 years. Rheumatoid factor was positive in 77.6% of cases. A atlanto-axial dislocation was found in 4.1% of cases and coxitis in 8.2% of cases. All patients were

on symptomatic treatment, 57.1% of whom were on corticosteroid therapy. 83.67% of patients were on cs-DMARDs and 14.2% were on biologics. At inclusion, sleep was optimal in 63.2% of cases and the mean Sleep Problem Index was 26.19 $\pm$ 22.77.

The index of sleep problems was higher in older subjects and in those with long diagnostic delays. The presence of co-morbidities and atlanto-axial dislocation and/or coxitis was associated with impaired sleep quality. Also, VAS pain and EGP were associated with an increase in the sleep problem index. In the multi-variate study, EGP, the presence of co-morbidities and atlanto-axial dislocation and/or coxitis were the independent factors affecting sleep quality.

Conclusion: The impact of RA on the patient's quality of life and especially the quality of sleep is confirmed by several studies in the literature. A global management of the patient is necessary in order to adapt well to his disease.

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AB0140 A HIGH-CONFIDENCE DEFINITION OF THERAPEUTIC RESPONSE IN RHEUMATOID ARTHRITIS USING A MONTE CARLO SIMULATION APPROACH

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Background: Therapy choice and therapy change depend on the ability to accurately assess patients' disease activity. The clinical assessments used to evaluate treatment response in rheumatoid arthritis have inherent variability, normally considered as measurement error, intra-observer variability or within subject variability. Each contribute to variability in deriving response status as defined by composite measures such as the ACR or EULAR criteria, particularly when a one-time observed measurement lies near the boundary defining response or non-response. To select an optimal therapeutic strategy in the burgeoning age of precision medicine in rheumatology, achieve the lowest disease activity and maximize long-term health outcomes for each patient, improved treatment response definitions are needed.

Objectives: Develop a high-confidence definition of treatment response and non-response in rheumatoid arthritis that exceeds the expected variability of subcomponents in the composite response criteria.

Methods: A Monte Carlo simulation approach was used to assess ACR50 and EULAR response outcomes in 100 rheumatoid arthritis patients who had been treated for 6 months with a TNF inhibitor therapy. Monte Carlo simulations were run with 2000 iterations implemented with measurement variability derived for each clinical assessment: tender joint count, swollen joint count, Health Assessment Questionnaire disability index (HAQ-DI), patient pain assessment, patient global assessment, physician global assessment, serum C-reactive protein level (CRP) and disease activity score 28-joint count with CRP.¹⁻³ Each iteration of the Monte Carlo simulation generated one outcome with a value of 0 or 1 indicating non-responder or responder, respectively.

Results: A fidelity score, calculated separately for ACR50 and EULAR response, was defined as an aggregated score from 2000 iterations reported as a fraction that ranges from 0 to 1. The fidelity score depicted a spectrum of response covering strong non-responders, inconclusive statuses and strong responders. A fidelity score around 0.5 typified a response status with extreme variability and inconclusive clinical response to treatment. High-fidelity scores were defined as >0.7 or <0.3 for responders and non-responders, respectively, meaning that the simulated clinical response status label among all simulations agreed at least 70% of the time. High-confidence true responders were considered as those patients with high-fidelity outcomes in both ACR50 and EULAR outcomes.

Conclusion: A definition of response to treatment should exceed the expected variability of the clinical assessments used in the composite measure of therapeutic response. By defining high-confidence responders and non-responders, the true impact of therapeutic efficacy can be determined, thus forging a path to development of better treatment options and advanced precision medicine tools in rheumatoid arthritis.

REFERENCES:

- [1] Cheung, P. P., Gossec, L., Mak, A. & March, L. Reliability of joint count assessment in rheumatoid arthritis: a systematic literature review. *Semin Arthritis Rheum* 43, 721-729, doi:10.1016/j.semarthrit.2013.11.003 (2014).
- [2] Uhlig, T., Kvien, T. K. & Pincus, T. Test-retest reliability of disease activity core set measures and indices in rheumatoid arthritis. *Ann Rheum Dis* 68, 972-975, doi:10.1136/ard.2008.097345 (2009).
- [3] Maska, L., Anderson, J. & Michaud, K. Measures of functional status and quality of life in rheumatoid arthritis: Health Assessment Questionnaire Disability Index (HAQ), Modified Health Assessment Questionnaire (MHAQ), Multidimensional Health Assessment Questionnaire (MDHAQ), Health Assessment Questionnaire II (HAQ-II), Improved Health Assessment Questionnaire (Improved HAQ), and Rheumatoid Arthritis Quality of Life (RAQoL). *Arthritis Care Res (Hoboken)* 63 Suppl 11, S4-13, doi:10.1002/acr.20620 (2011).