Real-World Disease Activity and Treatment Responsiveness Among Adults with Rheumatoid Arthritis

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Background

- Rheumatoid arthritis (RA) management relies on the "treat-to-target" principle, requiring regular assessment of disease activity for guidance.[1]
- Common measures used in clinical practice include the Disease Activity Score in 28 Joints (DAS28) and the patient-reported Routine Assessment of Patient Index Data 3 (RAPID3).[2, 3]
- While clinical trials show high efficacy for various treatments, there is limited data on real-world responsiveness and how assessment frequency impacts documented outcomes.[4]
- This study aims to describe changes in disease activity by treatment class and the impact of assessment intervals on responsiveness.

Objective

- To describe changes in disease activity (measured by RAPID3 and DAS28-CRP) and treatment responsiveness by therapy class among adults with RA in a real-world setting.

Methods

- A retrospective analysis using electronic health records (EHRs) from the OMNY Health real-world data platform of patients with RA (M05.xx or M06.xx, ICD-10-CM) between 2020 to 2025.
- Patients were indexed at the earliest encounter in EHR following the RA diagnosis, defined as the initiation of any of the following:
  - Conventional disease-modifying anti-rheumatic drugs (csDMARDs)
  - Targeted synthetic DMARDs (tsDMARDs)
  - Biologics/biosimilars (BIOLOGIC)
  - Systemic steroids (STEROID)
- Patients were selected if they were ages ≥ 18 years, had ≥1 year pre- and post-index data available, a disease activity measure before index the index date, and another disease activity measure ≥ 28 days after the index date.
- Disease activity responsiveness was measured by the following improvements in metrics:
  - DAS28-CRP Response:[2]
    - Major (>1.2 points)
    - Moderate (0.6 to 1.2 points)
    - No/Minimal (≤ 0.6 points)
  - RAPID3 Response: [3]
    - Responder (≥ 3.8 points)
    - Non-responder (< 3.8 points)
- Patient characteristics were reported on or before index, and pre-index disease responsiveness was evaluated at the date prior to and closest to the index date. Follow-up disease responsiveness was assessed at least 28 days after the index date.

Results

- Of 563,190 patients with an RA diagnosis code, 8,164 patients were included with the following distribution:
  - 5% Biologics
  - 49% csDMARD
  - 3% tsDMARDs
  - 43% Systemic steroids
- Patient demographic and clinical characteristics are presented in **Table 1**.
  - Patients were majority female and White across all groups.
  - Patients on tsDMARD were younger, compared to other treatment groups
  - High comorbidity burden was observed across all treatment groups, with high rates of hyperlipidemia, hypertension, and vitamin D deficiency.
  - Biologic users had higher rates of osteoporosis (23%), compared to other treatment groups.
  - Systemic steroid users had higher rates of anxiety (27%) and depression (16%), compared to other treatment groups.

Disease Activity, Assessment Timing, & Responsiveness

- The median time between disease activity assessments was 249 days
  - Shorter intervals between DAS28 assessments were associated with better documented response among biologic and steroid users
  - Longer intervals between RAPID3 assessments were associated with non-response across all classes.
- Change in disease activity shows improvement across all treatment groups and assessments, except tsDMARD and DAS28 **(Figure 1)**.
- Highest responsiveness was observed among patients on csDMARD with 29% moderate/major DAS28 response and 13% RAPID 3 responders **(Figure 2)**
- Lowest responsiveness was observed among patients on tsDMARDs (24% moderate/major DAS28; 9% RAPID3 responders; **Figure 2)**.

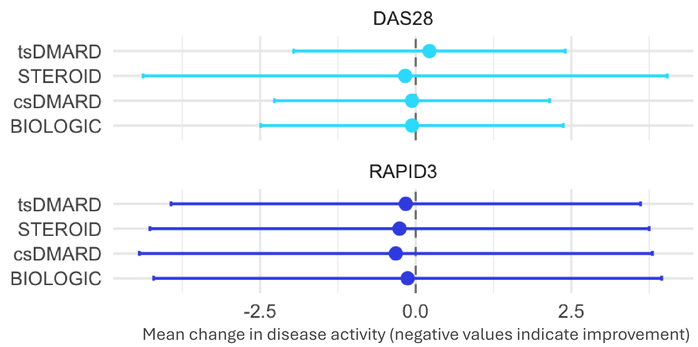
Conclusions

- Real-world disease activity documentation frequency varies significantly and is directly associated with measured treatment responsiveness.
- csDMARD demonstrated the highest levels of responsiveness across both clinical and patient-reported measures in this cohort, followed closely by biologic treatments.
- Consistent and timely monitoring is essential; longer gaps in assessment may lead to under-reporting of treatment benefits or delays in necessary therapy adjustments.
- These findings emphasize the need for standardized, frequent documentation to optimize RA management in clinical practice.

Table 1. Patient Demographic and Clinical Characteristics at Baseline

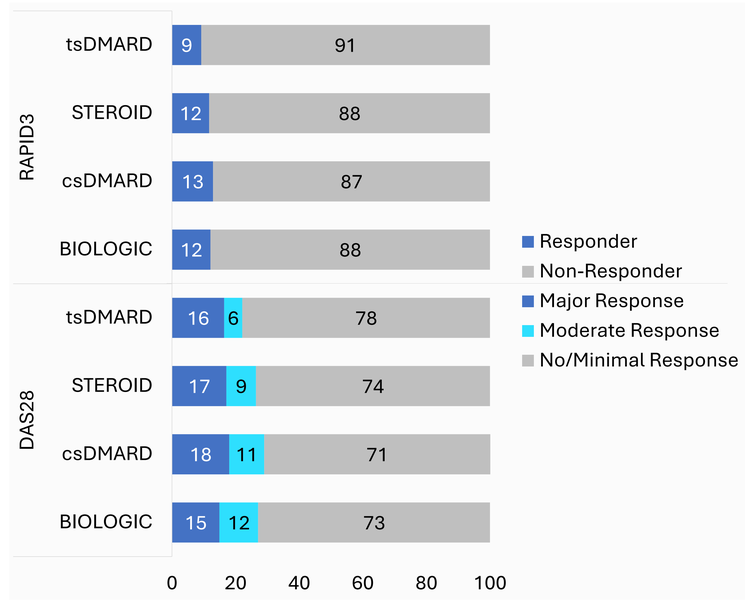
Characteristic	Overall N = 8,164	Biologic N = 443	csDMARD N = 3,993	Steroid N= 3,471	tsDMARD N=257
Demographics					
Female, n (%)	6,607 (81%)	365 (82%)	3,207 (80%)	2,817 (81%)	218 (85%)
Age in years, mean (SD)	60.8 (13.2)	63.4 (13.7)	60.8 (13.4)	60.8 (13.1)	57.9 (11.5)
Race, Black or African American, n(%)	1,734 (21%)	69 (16%)	812 (20%)	807 (23%)	46 (18%)
Race, White, n(%)	6,105 (75%)	359 (81%)	3,002 (75%)	2,545 (73%)	199 (77%)
Comorbid conditions, n(%)					
Anemia	1,356 (17%)	82 (19%)	594 (15%)	650 (19%)	30 (12%)
Anxiety	1,842 (23%)	95 (21%)	766 (19%)	937 (27%)	44 (17%)
Depression	1,045 (13%)	48 (11%)	417 (10%)	546 (16%)	34 (13%)
Hyperlipidemia	2,952 (36%)	136 (31%)	1,325 (38%)	1,415 (35%)	76 (30%)
Insomnia	935 (12%)	36 (14%)	379 (10%)	484 (14%)	36 (8%)
Obesity	1,995 (24%)	109 (25%)	908 (26%)	933 (23%)	45 (18%)
Osteoarthritis	1,896 (23%)	94 (21%)	877 (22%)	889 (26%)	36 (14%)
Osteoporosis	1,202 (15%)	103 (23%)	529 (13%)	542 (16%)	28 (11%)
Other Fatigue	2,209 (27%)	111 (25%)	982 (25%)	1,053 (30%)	63 (25%)
Primary Hypertension	3,823 (47%)	212 (48%)	1,709 (49%)	1,806 (45%)	96 (37%)
Type 2 Diabetes	1,362 (17%)	75 (17%)	623 (18%)	625 (16%)	39 (15%)
Vitamin D Deficiency, Unspecified	2,768 (34%)	168 (38%)	1,230 (31%)	1,274 (37%)	96 (37%)

Figure 1. Mean change in disease activity, by drug class and test type



Treatment	Assessment	N	Mean Change (SD)	Range (Min, Max)
BIOLOGIC	DAS28	328	-0.06 (2.4)	(-27.9, 5.7)
	RAPID3	1229	-0.13 (4.1)	(-23.0, 17.5)
csDMARD	DAS28	712	-0.06 (2.2)	(-23.8, 5.8)
	RAPID3	2810	-0.32 (4.1)	(-25.0, 19.9)
STEROID	DAS28	397	-0.17 (4.2)	(-57.3, 7.1)
	RAPID3	2298	-0.26 (4.0)	(-23.0, 17.0)
tsDMARD	DAS28	122	0.22 (2.2)	(-16.2, 6.0)
	RAPID3	217	-0.16 (3.8)	(-18.2, 17.7)

Figure 2. Disease responsiveness by drug class and test type



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Abbreviations: csDMARDs = conventional disease-modifying anti-rheumatic drugs ; DAS28 = Disease Activity Score in 28 Joints; EHR = electronic health record; ICD-10 = International Classification of Diseases, 10th Revision; n = numerator; N = denominator; RA = rheumatoid arthritis; RAPID3 = Routine Assessment of Patient Index Data 3; tsDMARDs = targeted synthetic DMARDs.

References: 1. Drosos AA, Pelechas E, Voulgari PV. Treatment strategies are more important than drugs in the management of rheumatoid arthritis. Clin Rheumatol. 2020 Apr;39(4):1363-1368.; 2. Nielung L, Christensen R, Danneskiold-Samsøe B, Bliddal H, Holm CC, Ellegaard K, Slott Jensen H, Bartels EM. Validity and Agreement between the 28-Joint Disease Activity Score Based on C-Reactive Protein and Erythrocyte Sedimentation Rate in Patients with Rheumatoid Arthritis. Arthritis. 2015;2015:401690.; 3. Bergman M, Buch MH, Tanaka Y, Citera G, Bahlas S, Wong E, Song Y, Zueger P, Ali M, Strand V. Routine Assessment of Patient Index Data 3 (RAPID3) in Patients with Rheumatoid Arthritis Treated with Long-Term Upadacitinib Therapy in Five Randomized Controlled Trials. Rheumatol Ther. 2022 Dec;9(6):1517-1529. 4. Solomon DH, Losina E, Lu B, Zak A, Corrigan C, Lee SB, Agosti J, Bitton A, Harrold LR, Pincus T, Radner H, Yu Z, Smolen JS, Fraenkel L, Katz JN. Implementation of Treat-to-Target in Rheumatoid Arthritis Through a Learning Collaborative: Results of a Randomized Controlled Trial. Arthritis Rheumatol. 2017 Jul;69(7):1374-1380.

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