Depression and Patient Outcomes Among Rheumatoid Arthritis Patients in a Large US-Based Real World Cohort

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Background

- The pain and disability associated with rheumatoid arthritis may put patients at greater risk for depression.
- Depression can also exacerbate RA symptoms, and if left unaddressed, depression can impact the effectiveness of RA treatments.
- Comparison of patient and physician reported disease activity scores for patients with and without depression can be used to assess the impact of depression
- Further research is needed to better describe the role that depression plays in RA.

Objective

To characterize the association of depression with disease activity, pain and fatigue scores in a cohort of patients with RA.

Methods

- The OM1 Data Cloud (OM1, Boston, MA) collects, links and leverages additional structured and unstructured data from electronic medical records (EMR), claims and other sources in an ongoing and continuously updating manner. These linkages provide ongoing data from rheumatologists, primary care and other specialties, which is important in understanding the multi-systemic burden of the disease.
- In the OM1 RA Registry, more than 120,000 patients are followed longitudinally by rheumatologists with deep clinical data, including laboratory, symptom, patient-reported and disease activity score (DAS) information.
- For this analysis, patients were required to be at least 16 years and have at least 1 of the following: 2+ RA diagnosis codes from a rheumatologist at least 30 days apart, 1+ inpatient RA diagnosis code, 2+ outpatient RA diagnosis codes at least 30 days but less than 1 year apart, or 1+ outpatient RA diagnosis code and at least 1 disease-modifying anti-rheumatic drug (DMARD) medication record (and <2 diagnosis codes for other conditions for which DMARDs may be prescribed).
- Patients meeting cohort entry criteria starting from January 2013 through March 2019 were included in analyses
- Fatigue score and multidimensional health questionnaires (MDHAQ) were used to assess patient pain and fatigue, as well as routine assessment of patient index data 3 (RAPID3) scores. Tender and swollen joint counts were also reported.
- Depression was defined as having 2 or more diagnosis codes for depression at least 30 days apart.

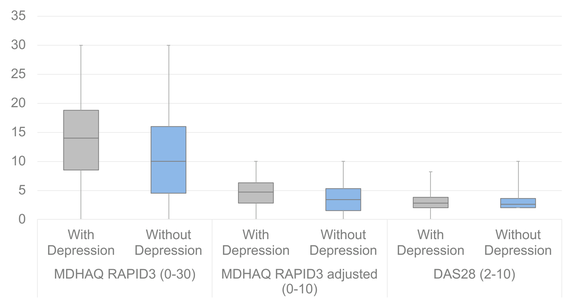
Results

- There were 102,967 patients that had at least one DAS, 76.3% were women, and 22.5% of patients met the definition for depression at some time during the observation period.
- Overall, median age was 60 (IQR: 50,69 years) and patients had an average duration of 68 months (IQR: 56,72) observed in the database.
- The proportion of women with depression was 24.8%, compared to 15.3% for men.
- Patients with depression were younger (median 57 years vs. 60) and less likely to have initiated a bDMARD (22.8% vs. 26.0%). 10.3% of patients with depression initiated a bDMARD before the observed diagnosis, compared to 16.2% after the observed diagnosis.
- For most DASs, the median measures recorded before the qualifying diagnosis were similar to the median scores recorded after the diagnosis.
- When restricted to scores observed after the depression diagnosis, the patients with depression had notably higher RAPID3 (14.0 vs. 10.0), RAPID3 adjusted (4.7 vs. 3.4) (**Figure 1**), CDAI (11.0 vs.8.5), SDAI (13.8 vs. 11.5) (**Figure 2**), and patient reported VAS scores (5.0 vs. 4.0) (**Figure 3**). P-values <0.0001 for all comparisons.
- Regardless of depression status, patients reported greater disease activity than physician reported scores. For patients with depression: median MDHAQ patient reported pain=6.0 , MDHAQ global VAS=5.0 , fatigue score=6.0 while MDHAQ physician reported score=2.0. For patients without depression: median MDHAQ patient reported pain=4.5, MDHAQ global VAS=4.0, fatigue score=5.0 while MDHAQ physician reported score=1.0 (**Figure 3**).
- Median CDAI scores were notably higher among patients who initiated bDMARD treatment after their depression diagnosis, compared to those who did not initiate bDMARD treatment (13.0 vs 9.0) (**Table 1**). Median tender joint counts were also higher among patients who initiated bDMARD treatment after their depression diagnosis (3.0 vs. 1.0) (**Table 1**).

Conclusions

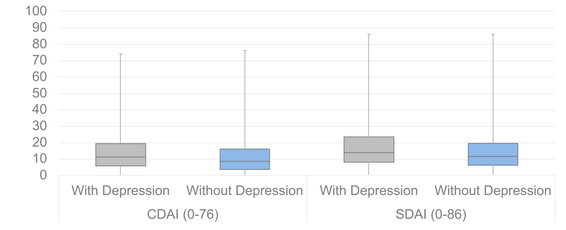
- Further exploration of differences between patients and physician reported disease activity and potential influence on treatment decisions is warranted.
- Given the high cost and complexity of RA treatments such as bDMARDS, full assessment of the impact of depression on patient reported DASs should be part of the evaluation of treatment choice and outcomes to reduce disease burden.

Figure 1. Comparison of Median Disease Activity Scores between Patients With and Without Depression



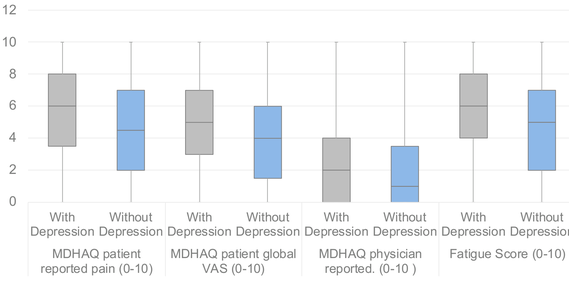
MDHAQ = Multidimensional Health Questionnaire;
RAPID3 = Routine Assessment of Patient Index Data 3;
DAS28 = Disease Activity Score 28

Figure 2. Comparison of Median Disease Activity Scores between Patients With and Without Depression



CDAI = Clinical Disease Activity Index;
SDAI= Simplified Disease Activity Index

Figure 3. Comparison of Median MDHAQ Scores between Patients With and Without Depression



MDHAQ = Multidimensional Health Questionnaire;
VAS= Visual Analog Scale

Table 1. Comparison of Median Scores between Patients with Depression Who Initiated vs Did Not Initiate bDMARD Treatment after their Depression Diagnosis

	Patients who initiated bDMARDs after depression diagnosis*			Patients who did not initiate bDMARDs after depression diagnosis*			
Score	N patients with at least 1 score	Mean # scores per person	Median Score (Q1, Q3)	N patients with at least 1 score	Mean # scores per person	Median Score (Q1, Q3)	p-value **
MDHAQ RAPID3 (0-30)	2,928	4.39	14.3 (9.3, 19)	3,376	2.90	13.2 (7.2, 18.2)	<0.0001
MDHAQ RAPID3 Adjusted (0-10)	2,787	4.36	4.8 (3.1, 6.3)	3,128	2.88	4.4 (2.4, 6.1)	<0.0001
CDAI (0-76)	1,829	4.11	13.0 (6.5, 21.5)	1,821	2.88	9.0 (4.0, 15.5)	<0.0001
SDAI (0-86)	245	3.46	15.5 (9.9, 27.5)	223	2.78	12.6 (7.6, 20.0)	<0.0001
DAS28 (2-10)	163	3.10	3.0 (2.2, 4.0)	138	2.78	2.5 (2.0, 3.4)	<0.0001
MDHAQ patient reported pain (0-10)	2,945	4.44	6.0 (4.0, 8.0)	3,339	2.91	6.0 (3.0, 8.0)	<0.0001
MDHAQ patient global VAS (0-10)	3,075	4.68	5.0 (3.0, 7.5)	3,557	3.01	5.0 (2.5, 7.0)	<0.0001
MDHAQ physician reported (0-10)	2,426	4.51	2.0 (0.0, 5.0)	2,568	2.99	1.0 (0.0, 3.5)	<0.0001
Fatigue score (0-10)	684	3.07	7.0 (4.5, 8.0)	870	2.29	6.0 (4.0, 8.0)	<0.0001
Tender Joint Counts (0-28)	2,724	5.55	3.0 (0.0, 8.0)	3,130	3.62	1.0 (0.0, 5.0)	<0.0001
Tender Joint Counts (0-76)	3,075	6.05	4.0 (0.0, 10.0)	3,761	3.91	2.0 (0.0, 6.0)	<0.0001
Swollen Joint Counts (0-28)	2,716	5.56	1.0 (0.0, 4.0)	3,120	3.63	0.0 (0.0, 2.0)	<0.0001
Swollen Joint Counts (0-76)	3,075	6.05	1.0 (0.0, 4.0)	3,759	3.91	0.0 (0.0, 2.0)	<0.0001
Charlson (0-10)	17,964	1.00	3.0 (2.0, 5.0)	118,091	1.00	4.0 (2.0, 6.0)	<0.0001

* Patients with 2+ depression codes; excludes patients who initiated bDMARDs prior to depression diagnosis
**Comparision between those who did and did not in initiate bDMARDS after depression diagnosis
MDHAQ = Multidimensional Health Qquestionnaire; RAPID3 = Routine Assessment of Patient Index Data 3; CDAI = Clinical Disease Activity Index; DAS28 = Disease Activity Score 28; VAS = Visual Analog Scale

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