Improvements in Disease Activity Scores Associated with bDMARDs in a Real World Rheumatoid Arthritis Cohort

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Background

- Rheumatoid arthritis is an autoimmune disease characterized by chronic joint inflammation, pain, and swelling.
- Available treatments target reducing inflammation, improving symptoms and slowing disease progression. Commonly used treatments are corticosteroids, disease modifying antirheumatic drugs (DMARDs) and biologic DMARDs (bDMARDs).
- Treatment with bDMARDs has enabled many patients to achieve remission or low disease activity, however, these drugs are costly and additional data are needed to guide treatment decisions regarding choice and timing of therapy.
- Disease activity scores (DAS) are specific clinical measures used to quantify abnormalities in patients with rheumatoid arthritis (RA).
- Changes in Routine Assessment of Patient Index Data 3 (RAPID3) scores, as well as swollen and tender joint counts, fatigue, pain, and global status scores are useful metrics to assess treatment effects of new and costly therapies such as bDMARDs.

Objective

To characterize the changes in RAPID3 scores, joint counts, fatigue and MDHAQ scores associated with bDMARD use.

Methods

- The OM1 Data Cloud (OM1, Boston, MA) collects, links and leverages 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.
- The OM1 RA Registry (OM1, Boston, MA) follows more than 100,000 adult patients longitudinally with deep clinical data, including laboratory, symptom, patient-reported and disease activity information.
- Patients were included in this analysis if they were 16 years of age or older 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 one disease-modifying anti-rheumatic drug (DMARD) medication record (and <2 diagnosis codes for other conditions for which DMARDs may be prescribed).
- The study period includes data from Jan 2013-June 2019.
- Differences in RAPID3 scores (range 0-10), joint counts (range 0-28), Fatigue VAS fatigue score (range 0-10), Multidimensional Health Questionnaires (MDHAQ) pain and physician-reported global status scores (range 0-10) before and 6-months after the start of 8 specific bDMARDS were assessed.

Results

- The cohort included150,327 patients with deep clinical data. 77% of patients were women and the average length of observation in the cohort was 5.45 years (S.D. 1.2).
- 131,177 patients (87%) were treated with a DMARD. Mean age at initiation of first DMARD was 60.1 years (S.D. 13.9).
- 67,864 patients (45%) were treated with a bDMARD. Mean age at initiation of first bDMARD was 58.6 years (S.D. 13.6)(Figure 1)
- Among the patients with swollen joint measures, the range of improvement over 6 months was 1.1 to 1.7 joints, with all bDMARDs showing an improvement. (Figure 2)
- Across a series of 8 bDMARDs, baseline values of RAPID3 ranged from 3.99 to 4.39. After 6 months following bDMARD treatment, scores ranged from 4.06 to 4.29. Six of eight bDMARDs showed an improvement in fatigue scores after 6 months of bDMARD treatment. (Table 1)
- There was also a trend toward improvement in pain (MDHAQ pain), and global status (MDHAQ physician reported global status) after 6 months of treatment across all eight bDMARDs. (Table 2)

Figure 1. Proportion of Patients treated with a bDMARD.

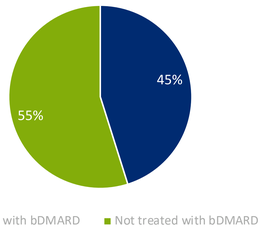

Figure 2. Improvement in Swollen Joint Count After 6 months bDMARD Treatment

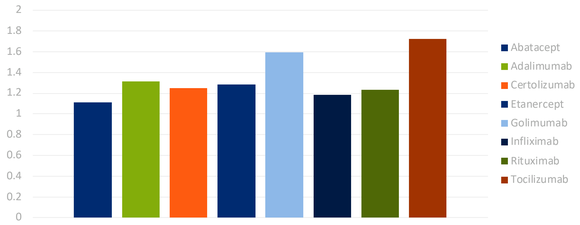

Table 1. RAPID3 and Fatigue VAS disease activity scores before and after bDMARD initiation

bDMARD	N	Mean(SD) baseline RAPID3	Mean(SD) RAPID3 ≥ 6 months after start of bDMARD	N	Mean(SD) baseline Fatigue VAS	Mean(SD) Fatigue VAS ≥ 6 months after start of bDMARD
Abatacept	1,116	4.39 (2.25)	4.28 (2.30)	88	5.55 (2.81)	5.40 (3.08)
Adalimumab	2,185	4.06 (2.26)	4.07 (2.28)	150	5.38 (2.79)	5.29 (2.91)
Certolizumab	655	4.21 (2.32)	4.24 (2.31)	36	5.50 (2.46)	5.38 (2.88)
Etanercept	1,888	3.99 (2.31)	4.06 (2.31)	171	5.11 (2.88)	4.95 (3.07)
Golimumab	669	4.11 (2.29)	4.20 (2.31)	64	5.01 (2.56)	4.84 (2.90)
Infliximab	1,090	4.09 (2.33)	4.14 (2.32)	40	5.76 (3.31)	6.40 (3.05)
Rituximab	533	4.08 (2.42)	4.09 (2.36)	44	5.50 (3.03)	4.86 (3.17)
Tocilizumab	587	4.23 (2.38)	4.29 (2.36)	31	4.85 (2.95)	5.40 (3.12)

Table 2. MDHAQ scores before and after bDMARD initiation

bDMARD	N	Mean(SD) baseline MDHAQ physician-reported	Mean(SD) MDHAQ physician-reported (≥ 6 months after start of bDMARD)	N	Mean(SD) baseline MDHAQ Pain	Mean(SD) MDHAQ Pain ≥ 6 months after start of bDMARD
Abatacept	765	3.23 (2.59)	2.44 (2.27)	879	5.38 (2.87)	4.93 (2.89)
Adalimumab	1,389	2.83 (2.65)	2.06 (2.26)	1,724	5.24 (2.82)	4.60 (2.95)
Certolizumab	356	3.07 (2.71)	2.32 (2.30)	478	5.40 (2.97)	4.86 (2.99)
Etanercept	1,340	2.96 (2.64)	2.29 (2.42)	1,625	5.10 (2.85)	4.65 (2.96)
Golimumab	414	3.41 (2.61)	2.21 (2.14)	433	5.09 (2.86)	4.67 (2.83)
Infliximab	970	2.71 (2.68)	1.99 (2.29)	940	5.19 (2.96)	4.74 (3.03)
Rituximab	426	3.01 (2.68)	2.38 (2.28)	412	5.04 (2.91)	4.64 (2.93)
Tocilizumab	385	3.21 (2.89)	2.09 (2.36)	433	5.35 (3.07)	5.01 (3.01)

Conclusions

- Within a real world cohort of RA patients with disease scores before and after bDMARD initiation, improvements were seen in a variety of disease scores.
- Identification of the impact that bDMARDS have on these metrics provides insight into appropriate use of these costly medications.

Conference

Presented at ICPE Annual Conference. August 28, 2019 . Philadelphia, PA , USA