TREATMENT RESPONSE AND DISEASE BURDEN OF PATIENTS WITH RHEUMATOID ARTHRITIS IN TAIWAN

RWD94

Chao-Hsiun Tang[1]; Ko-Jen Li[2]; Chih-Yu Liao[3]; Po-Ya Chuang[4]; Wesley Furnback[4]; Bruce CM Wang[4]; Soyoung Kim[5]
[1]School of Health Care Administration, Taipei Medical University, Taipei, Taiwan; [2]Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan;
[3]Astellas Pharma Taiwan Inc., Taipei, Taiwan; [4]Real Chemistry Inc., New York, USA; and [5]Astellas Pharma Singapore Pte. Ltd, Singapore

OBJECTIVE

- To evaluate treatment response, healthcare resource utilization (HCRU), and direct costs for patients with rheumatoid arthritis (RA) initiating conventional disease-modifying antirheumatic drugs (csDMARDs) or biologics in Taiwan.

METHOD

Data Source

- Taiwan's National Health Insurance Research Database (NHIRD) from January 1, 2015, through December 31, 2018, was used to conduct a retrospective observational study in patients with rheumatoid arthritis.

Study Period

- An index period from January 1, 2016, through December 31, 2016, with a pre-index period spanning the 365 days prior to the index date was used to identify two mutually exclusive cohorts of RA patients: (1) previously csDMARD-naïve patient initiating a csDMARD (csDMARD cohort) and (2) previously biologic-naïve patients initiating a biologic (biologic cohort).
- Both cohorts were respectively indexed upon the date of their first csDMARD or biologic during the index period and followed through up to two years.

Patient Population

- Patients with RA were first enrolled in this study if they met the following inclusion/exclusion criteria:
  - Inclusion Criteria
    - ≥ 2 primary or secondary healthcare claims for Rheumatoid Arthritis (ICD-9-CM codes: 714.xx excluding 714.3) in any setting, with the claim coming within 90 days of the previous claim during the index period
  - Exclusion Criteria
    - Less than 18 years of age at index
    - Disenrolled in the NHIRD during the pre-index period
    - Had ≥1 claim for comorbid psoriasis or psoriatic arthritis, ankylosing spondylitis, Crohn's disease, ulcerative colitis and juvenile chronic polyarthritis during the study period
- The biologic cohort were identified from those enrolled RA patients if they had a claim for an included biologic* during the index period but did not have any biologic during the pre-index period.
- The csDMARD cohort were further identified from the remaining RA patients if they had a claim for an included csDMARD* during the index period without any biologic and csDMARD during the pre-index period.

Response Measurement

- The response to csDMARDs and biologics at the one-year after initiation were assessed for both cohorts separately by using a validated claims-based algorithm with local clinical expert opinion[1] [2].
- Patients in both cohorts were respectively categorized into three groups based on their response: (1) stable; (2) inadequate response (IR); (3) unknown.
- Patients were classified as IR if they fulfill any of the following criteria during the one-year follow up period:
  - Low adherence (less than 80% of proportion of days covered)
  - Switch or add of a biologic
  - Addition of a new csDMARD
  - Glucocorticoid joint injection
  - Increased dose of oral glucocorticoid.
  - Increased dose of index csDMARD (for csDMARD cohort only)

Statistical Analysis

- Baseline characteristics including age, gender and Charlson Comorbidity Index score were measured for stable and IR patients in each cohort, respectively.
- Direct costs and HCRU during the two-years follow-up period were also measured for two groups. All HCRU and costs were measured as all-cause and RA-related.
- Chi-square test and Student's t-test were used for categorical variables and continuous variables respectively to test the statistical differences in each measure between two groups.

*Included biologics were adalimumab, etanercept, golimumab, abatacept, rituximab, tocilizumab and tofacitinib, and included csDMARDs were methotrexate, hydroxychloroquine, sulfasalazine, and leflunomide.

References: [1] Curtis JR, Baddley JW, Yang S, et al. Arthritis Research & Therapy. 2011;13(5):R155; [2] Shi Q, Li KJ, Treuer T, et al.PLoS One. 2018;13(4):e0193489

RESULTS

Patient Characteristics and Response Measurement

- There were 7,570 and 1,770 RA patients newly initiating a csDMARD or biologic in 2016, respectively. After one-year 28.4% (n=2150) and 70.1% (n=5304) of csDMARD initiators and 55.4% (n=981) and 42.9% (n=760) of biologic initiators were classified as stable or IR, respectively.
- Of the csDMARD initiators classified as IR, 78.6% had low adherence and 51.8% added a new csDMARD. Of the biologic initiators classified as IR, 49.9% had > 1 glucocorticoid joint injection, 36.7% had an increase in glucocorticoid dose, 26.6% switched a biologic, 16.8% added a new csDMARD, and 9.1% had low adherence.
- Patients were mostly female in both cohorts of csDMARD (75.9%) and biologic (74.4%) initiators. Stable patients were older in the csDMARD cohort (mean age: 55.7 vs. 54.8) but younger in the biologic cohort (56.0 vs. 58.1) compared with IR patients (Table 1).

Table 1. Demographics and Comorbidities

Characteristic	Biologic Cohort									csDMARD Cohort								
	All Biologics (N = 1,770)		Biologic-Stable (N = 981)		Biologic-IR (N = 760)		Biologic-Unknown (N = 29)			All csDMARDs (N = 7,570)		csDMARD-Stable (N = 2,150)		csDMARD-IR (N = 5,304)		csDMARD-Unknown (N = 116)		
	N	%	N	%	N	%	N	%		N	%	N	%	N	%	N	%	
Age, mean ± SD	57.0 ± 12.8		56.0 ± 12.9		58.1 ± 12.5		63.5 ± 13.5		*	55.2 ± 14.2		55.7 ± 14.2		54.8 ± 14.0		64.5 ± 16.3		*
Gender																		
Male	371	21.0	205	20.9	153	20.1	13	44.8		1743	23.0	479	22.3	1217	22.9	47	40.5	
Female	1386	78.3	769	78.4	603	79.3	14	48.3		5745	75.9	1649	76.7	4036	76.1	60	51.7	
Missing	13	0.7	7	0.7	4	0.5	2	6.9		82	1.1	22	1.0	51	1.0	9	7.8	
CCI, mean ± SD	2.1 ± 1.5		2.0 ± 1.4		2.2 ± 1.6		3.2 ± 1.9		*	2.1 ± 1.5		2.1 ± 1.5		2.0 ± 1.4		3.3 ± 2.3		

Abbreviations: CCI = Charlson Comorbidity Index; SD = Standard Deviation;
**Stable vs. IR; P<0.05*

Figure 1. Healthcare Resource Utilization – csDMARD Cohort

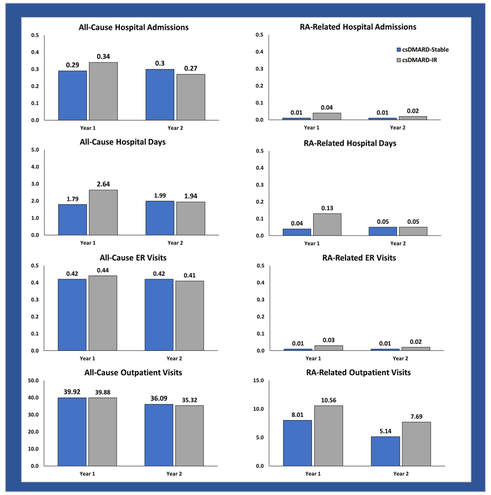
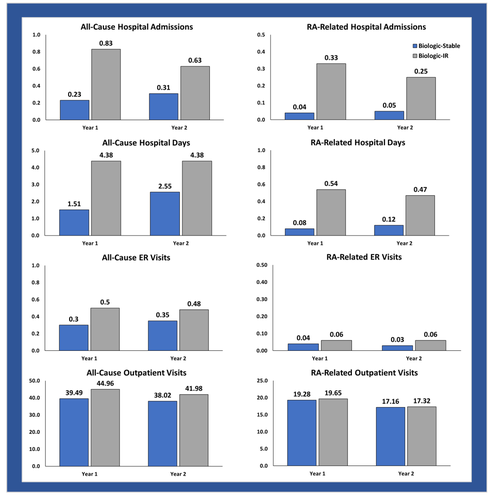


Figure 2. Healthcare Resource Utilization – Biologic Cohort



Healthcare Resource Utilization

- In the csDMARD cohort, RA-related hospital admissions (0.04 vs. 0.01, p=0.002), hospital days (0.13 vs. 0.04, p=0.0004), emergency department (ED) visits (0.03 vs. 0.01; p=0.0017), and outpatient visits (10.59 vs. 8.05, p<.0001) were all significantly higher for patients with IR compared to those with stable response during the first year of follow-up (Figure 1).
- In the biologic cohort, patients with IR had significantly increased all-cause HCRU for every measured category compared to those with stable response in both year 1 and year 2. IR patients also had significantly higher RA-related hospitalization (0.3 vs. 0.04, p<0.0001) and RA-related hospital days (0.5 vs. 0.1, p<0.0001) during the two years follow-up period (Figure 2).

Direct Healthcare Costs

- In the csDMARD cohort, patients with stable response had significant lower mean total costs for all-cause (NT$54,276 vs. NT$63,163, p=0.0346; NT$54,772 vs. NT$79,465, p<0.0001) and RA-related costs (NT$9,765 vs. NT$19,725; p<0.0001; NT$8,608 vs. NT$35,764; p<0.0001) compared to IR patients in both year 1 and year 2. All-cause total direct costs rose an average of 25.8% with a 79.6% increase in medication costs from year 1 to year 2 for IR patients. RA-related total costs of IR patients increased even more with an average of 81% in year 2, mainly driven by more than 2.5 times increase in medication costs (Figure 3).
- In the biologic cohort, patients with stable response had significant lower mean total all-cause costs (NT$39,279 vs. NT$409,408, p=0.0174) than IR patients during the first year of follow-up. Stable patients had significant higher mean total RA-related costs during the follow-up period, which was primarily because of higher RA-related medication costs (Figure 4).

Figure 3. Healthcare Costs – csDMARD Cohort

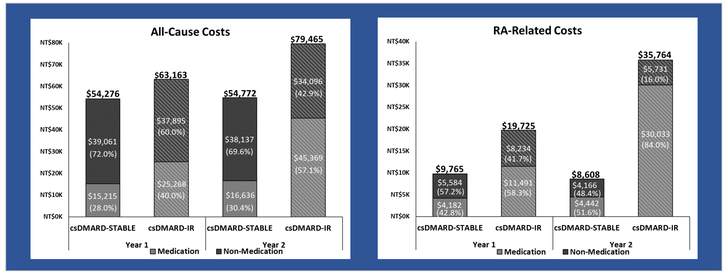
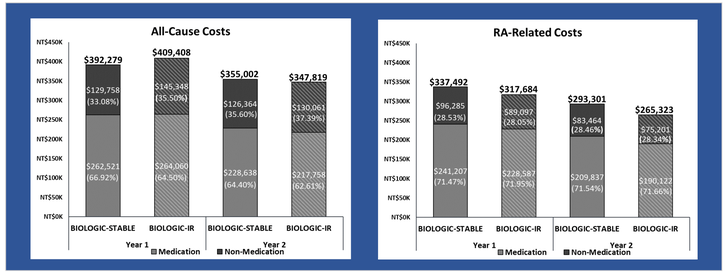


Figure 4. Healthcare Costs – Biologic Cohort



LIMITATIONS

- This study is subject to miscoding in the dataset and thus misdiagnosis. Without clinical information the reliance on ICD codes can also lead to misdiagnosis.
- The algorithm of response measurement outside the United States has not been validated.
- The claims in this database lack of important clinical information, so the true clinical response for patients was still unclear.
- As the real-time data was unavailable and new medications have been introduced, our analysis may not reflect current treatment response.

CONCLUSIONS

- RA patients initiating their first csDMARD or biologic and achieving a stable response, demonstrated lower healthcare resource utilization and costs compared to those with an inadequate response.

This study was funded by Astellas Pharma Taiwan