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Evaluating Quality of Care for Rheumatoid Arthritis for the Population of Alberta Using System-level Performance Measures

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ABSTRACT. ***Objective.*** We evaluated 4 national rheumatoid arthritis (RA) system-level performance measures (PM) in Alberta, Canada.

Methods. Incident and prevalent RA cases ≥ 16 years of age since 2002 were identified using a validated case definition applied in provincial administrative data. Performance was ascertained through analysis of health data between fiscal years 2012/13–2015/16. Measures evaluated were as follows: proportion of incident RA cases with a rheumatologist visit within 1 year of first RA diagnosis code (PM1); proportion of prevalent RA patients who were dispensed a disease-modifying antirheumatic drug (DMARD) annually (PM2); time from first visit with an RA code to DMARD dispensation and proportion of incident cases where the 14-day benchmark for dispensation was met (PM3); and proportion of patients seen in annual follow-up (PM4).

Results. There were 31,566 prevalent and 2730 incident RA cases (2012/13). Over the analysis period, the proportion of patients seen by a rheumatologist within 1 year of onset (PM1) increased from 55% to 63%; however, the proportion of RA patients dispensed DMARD annually (PM2) remained low at 43%. While the median time to DMARD from first visit date in people who received DMARD improved over time from 39 days to 28 days, only 38–41% of patients received treatment within the 14-day benchmark (PM3). The percentage of patients seen in yearly follow-up (PM4) varied between 73–80%.

Conclusion. The existing Alberta healthcare system for RA is suboptimal, indicating barriers to accessing specialty care and treatment. Our results inform quality improvement initiatives required within the province to meet national standards of care.

Key Indexing Terms: access, quality improvement, quality indicator

Early access to care and treatment initiation for patients with rheumatoid arthritis (RA) helps optimize outcomes. Delays in access to specialty rheumatology care and treatment are commonly reported[1,2,3]. To evaluate the timely diagnosis,

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treatment, and evidence-based care for patients with inflammatory arthritis conditions, the Arthritis Alliance of Canada (AAC)[4] developed 6 system-level performance measures (PM) that benchmark optimal care[5]. The measures have been tested in 5 Canadian provinces using different data sources including clinic data[6], a longitudinal early arthritis cohort study[7], and administrative databases in the province of British Columbia (BC)[8]. The study aims to expand knowledge on health system performance in RA care to the publicly funded healthcare system in the province of Alberta, Canada.

MATERIALS AND METHODS

Study design and data sources. We conducted a population-based retrospective cohort study using administrative health data from Alberta, acquired from Alberta Health (Ministry of Health) and Alberta Health Services (AHS)[9]. The Canadian healthcare system has a mix of both public and private service; however, the present study captures publicly funded specialist services and dispensed medications in the province. Datasets accessed were hospital discharge abstracts [using International Classification of Diseases, 10th revision (ICD-10) codes], practitioner claims [using ICD-9 Clinical Modification (CM) codes], the population registry from the Alberta Health Care Insurance Plan, and prescription dispensing from the Pharmacy Information Network (includes information on all pharmacy-dispensed medications). Ethics approval for the study was provided by the University of Calgary Conjoint Health Research Ethics Board (ethics ID REB13-0822).

Cohort definition. Incident and prevalent RA cases ≥ 16 years of age between the dates of April 1, 2002, and March 31, 2017, were identified using the 2016 Public Health Agency of Canada's surveillance case definition for RA[10,11,12], which included either 1 hospitalization separation (ICD-10, M05.X–M06.X), or 2 or more physician claims (ICD-9 CM 714.X) for RA at least 8 weeks apart and within a 2-year period (sensitivity of 83%, specificity of 99%, positive predictive value of 52%, and negative predictive value of 100%[13]). Exclusion criteria were applied subsequent to qualifying: cases with at least 2 physician visits (separated by at least 1 day) within 2 years for the same non-RA inflammatory arthritis, such as systemic autoimmune rheumatic diseases (710.x), polyarteritis nodosa and related conditions (446.x), polymyalgia rheumatica (725.x), psoriasis (696.x), ankylosing spondylitis, and other spondyloarthritides (720.x). A run-in period from 2002/03 to 2010/11 was used to allow enough time to capture all prevalent cases and appropriately classify incident cases[12].

Calculation of PM. Performance of 4 PM from the AAC set[5] were estimated through the linked datasets for fiscal years 2012/13 through 2015/16. To evaluate access to rheumatologist care, we measured the proportion of incident RA cases seen by a rheumatologist, defined as having at least 1 rheumatologist visit within 1 year of their first RA code (PM1). There is no rheumatologist identifier in the provincial administrative datasets, thus providers listed as internists who had at least 20% of their entire billings submitted for RA services were considered to be rheumatologists, along with rheumatologists who explicitly consented to have their personal physician identifiers included for the analysis. This method correctly identified 93% of known rheumatologists (through personal communication with AHS). For PM2, the proportion of prevalent RA patients dispensed a disease-modifying antirheumatic drug (DMARD) at least once during each measurement year was calculated. DMARD included conventional DMARD (e.g., methotrexate, hydroxychloroquine, sulfasalazine, leflunomide), other immunosuppressant agents used for rare complications of RA, biologic agents, and small-molecule inhibitors (complete list found in Supplementary Data, available from the authors on request). PM3 reports the time from the first visit with an RA code by any provider to first DMARD dispensation, and is reported in the fiscal year of RA incidence. For PM2 and PM3, patients were excluded from the denominator for the measurement year if they were pregnant, had HIV, or had a new malignancy diagnosis; this is because treatment decision making in these conditions is more nuanced and not well captured using this measure (definitions found in Supplementary Data, available from the authors on request). The proportion of cases meeting the 14-day benchmark from first RA visit to DMARD dispensation was also estimated[5,14]. For PM4, the proportion of patients under the care of a rheumatologist seen in follow-up by a rheumatologist during the measurement year was calculated. We defined "under rheumatologist care" as patients with RA who previously had a minimum of 2 rheumatologist visits prior to the year of reporting, to avoid including cases referred for RA where the diagnosis was not confirmed.

RESULTS

PM1. The proportion of incident RA cases seen by a rheumatologist increased over the analysis period, from 55% in the 2012/13 fiscal year to 63% by the 2015/2016 fiscal year (Figure 1).

PM2. The proportion of prevalent RA cases who were dispensed a DMARD during the measurement year was suboptimal and remained low over the course of follow-up at only 42–43% (Table 1).

PM3. For incident RA cases, the median time between the first RA visit and DMARD dispensation, amongst those who received a DMARD, is shown in Table 2. By fiscal year 2015/16, the median time to DMARD dispensation was 28 days, with a 90th percentile of 288 days; 41% of cases met the 14-day benchmark for DMARD start.

PM4. The number of prevalent RA cases under the care of a rheumatologist seen in yearly follow-up was between 73–80% for all fiscal years (Table 1).

DISCUSSION

Our analysis of system-level PM for Alberta RA care revealed suboptimal performance against national standards. Among patients with RA who sought assessment for their symptoms, only two-thirds were able to access a rheumatologist within 1 year of their disease. This improved over time, perhaps reflective of increasing Alberta rheumatologist numbers (38 in 2012 and 50 by 2016)[15]. There is a regional shortage of rheumatologists, which likely contributes to delays to access[16]; further study of this is ongoing. Delays in rheumatologist consultation have also been observed in Ontario using electronic medical record data[3] and in Quebec using administrative data[17].

The measures are also useful for understanding cross-provincial comparisons of RA health systems. We have recently completed a similar analysis in the province of BC[8], although over a different time period. Similarly, suboptimal rates of DMARD use were observed provincially (43% of patients in Alberta vs 37% in BC in 2014) when looking at all RA patients from any care provider. Of importance, in the Alberta analysis we did not examine rates of DMARD use for those under rheumatologist care. The analysis in BC revealed substantially higher DMARD dispensing rates (87% in 2014) for patients with RA under current rheumatologist care (defined as having a rheumatologist visit during the measurement year). Time to DMARD start in incident RA cases did not meet the Wait Time Alliance[14] 14-day benchmark in either province.

Similarly, low rates of DMARD use in RA have been shown

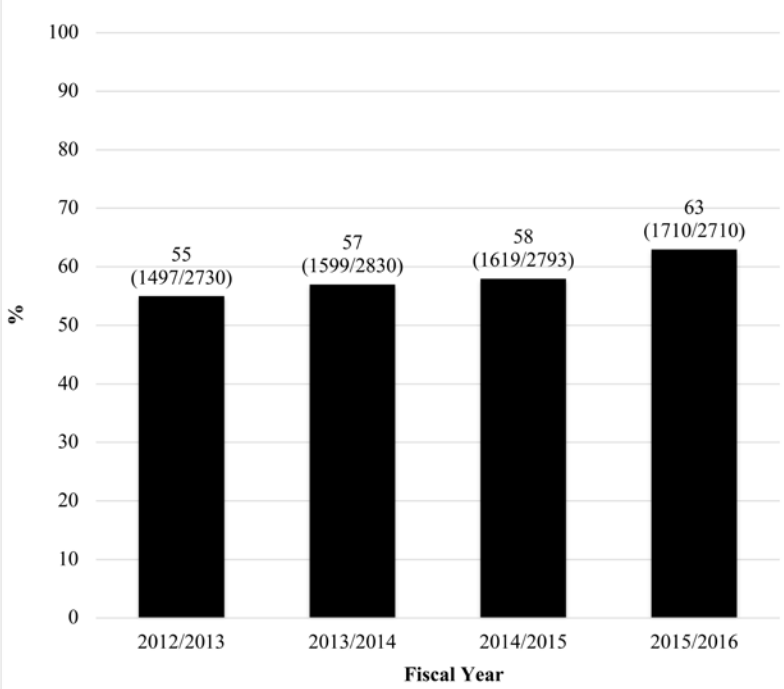

Figure 1. Percentage of incident RA cases referred to and seen by a rheumatologist within the first year of diagnosis. Diagnosis date is the date of first physician billing code or hospital discharge code for RA for those who meet the RA case definition. RA: rheumatoid arthritis.

Table 1. Treatment and follow-up care of prevalent RA cases in Alberta.

	Fiscal Years			
	2012/13	2013/14	2014/15	2015/16
Prevalent RA cases dispensed a DMARD[1]	42 (13,234/31,566)	42 (13,999/33,248)	43 (14,801/34,733)	43 (15,494/36,048)
Prevalent RA cases seen in annual follow-up among those under rheumatology care[2]	73 (2029/2788)	78 (2704/3479)	77 (3352/4348)	80 (4055/5087)

[1] DMARD include conventional DMARD, immunosuppressants used for treatment of RA complications, biologics, and small-molecule inhibitors (complete list shown in Supplementary Data, available from the authors on request). [2] Under rheumatology care defined as 2 or more rheumatologist visits after diagnosis prior to each year of reporting. DMARD: disease-modifying antirheumatic drug; RA: rheumatoid arthritis.

Table 2. Time from first RA visit to DMARD dispensation, among incident RA cases receiving a DMARD during the measurement year, and percentage meeting the 14-day benchmark.

	Fiscal Years			
	2012/13	2013/14	2014/15	2015/16
No. treated with DMARD, n[1,2]	1093	1039	1082	1047
Median time between first RA visit and DMARD dispensation, days	39	34	26	28
90th percentile time between first RA visit and DMARD dispensation, days[2]	467	423	296	288
Meeting 14-day Wait Time Alliance benchmark, %	38	40	42	41

[1] Number of incident RA cases treated with a DMARD during the measurement year by any provider type. [2] DMARD include conventional DMARD, immunosuppressants used for treatment of RA complications, biologics, and small-molecule inhibitors (complete list shown in Supplementary Data, available from the authors on request). DMARD: disease-modifying antirheumatic drug; RA: rheumatoid arthritis.

in other Canadian provinces such as Ontario[18], with most delays in initiation of DMARD starts occurring prior to rheumatologist consultation[3]. Potential reasons for delay could include patient and/or system-related reasons for not filling DMARD prescriptions immediately, including awaiting baseline laboratory results to gauge safety of DMARD start, patient financial situation, or patient attitudes to DMARD[19].

While our study provided a comprehensive population-based

assessment of these PM and allowed us to make important comparisons with measurement results in a neighboring province, there remain some limitations. Unlike the BC dataset, the Alberta dataset does not contain a rheumatologist identifier, which necessitated the development of an algorithm by AHS to identify rheumatologists based on the frequency of claims for RA diagnosis in that practitioner's billings and could have affected results. Due to the inherent limitations of administrative data, it is possible that case misclassification affected our results; however, we used a validated case definition to mitigate this possibility. We also did not have any linkage to laboratory results, and it is possible that the seropositive status of our patients could have affected our results on the performance measures.

In conclusion, provincial analysis for Alberta indicates that patients with RA experience difficulty in accessing specialty care, but once seen by a rheumatologist, ongoing follow-up rates were good over the time period evaluated. When evaluating treatment at the population level, a large proportion of RA patients are not receiving DMARD, which is considered essential in the treatment of RA: this suggests suboptimal management. This work contributes to a growing body of literature reporting on the system-level performance measures[5] in different provinces and using different data sources. This study also emphasizes important areas for planned quality improvement initiatives within the province and offers a baseline for the PM that can be tracked over time as new models of care are implemented to improve access to care and early treatment. It also highlights that further work is necessary to investigate predictors of the lower-than-expected rates of DMARD and to explore patient and provider perspectives on these findings. We also have future plans to assess the effect that the performance on these measures has on long-term patient outcomes.

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