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Factors associated with use of disease modifying agents for rheumatoid arthritis in the National Hospital and Ambulatory Medical Care Survey

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ABSTRACT

Objective: We examined the treatment patterns among adults with rheumatoid arthritis (RA) and identified factors influencing access to traditional and biological disease modifying antirheumatic drugs (DMARDs).

Methods: We analyzed visits recorded in the National Ambulatory Medical Care Survey from 2005 to 2014 with a RA diagnosis. The primary outcome was DMARD use (traditional and/or biological). We included prescriptions of all RA-related treatments such as traditional and biological DMARDs, glucocorticoids, gold preparations, immunosuppressants, and non-steroidal anti-inflammatory drugs. Covariates in the logistic regression models included age, gender, race/ethnicity, type of health care coverage, provider type, geographic region, and number of comorbidities.

Results: Among 1405 visits with a RA diagnosis, 60.4% (n = 807) were prescribed DMARDs and 23.8% (n = 334) biological DMARDs. In fully adjusted models, females have 1.57 times higher odds of any DMARD use (95% confidence interval (CI): 1.02–2.46). Also, Medicare beneficiaries as compared to privately insured have 2.31 times higher odds of receiving any DMARDs (95% CI: 1.40–3.82), while visits with specialist vs. general physician are 2.38 times more associated with any DMARD use (95% CI: 1.37–4.14). For biological DMARDs, Medicare beneficiaries were at 2.58 times higher odds (95% CI: 1.42–4.70) than privately insured, while visits with specialist are at 3.37 times higher odds than general physician (95% CI: 1.40–8.23).

Conclusion: Visits with a specialist and Medicare beneficiaries were significantly associated with any DMARD or biological DMARD use. Additionally, contrary to prior evidence, race/ethnicity was not associated with any DMARD or biological DMARD use, which may indicate reduction in disparity of treatment access.

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Significance and innovations

- The recent-most U.S. national survey of outpatient physician visit data shows that 76.8% visits among RA patients are associated with any DMARD use while 31.7% are associated with specifically biological DMARD use.
- Our results indicate that the type of insurance coverage and provider are significant indicators of RA treatment with traditional and biological DMARDs.
- Type of coverage may be a better indicator of DMARD treatment use than patient race/ethnicity and therefore, inadequate coverage may lead to underutilization of any DMARD treatment, especially the expensive biological DMARDs.

Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory condition that affects multiple joints in the body. The manifestations of RA are mainly chronic pain and joint deformity, which may lead to loss of function.[1] The aim of RA treatment is to prevent joint deformation, reduce pain, and avoid disability. Central to RA treatment are the disease modifying antirheumatic agents (DMARDs).[2] The DMARDs include traditional small molecule agents, such as methotrexate (MTX), and biologic agents (bDMARDs) (e.g. adalimumab and abatacept). The most-recent American College of Rheumatology (ACR) guidelines recommend traditional DMARDs as the first-line of treatment for early-onset RA while bDMARDs are usually recommended for moderate-to-severe RA or if treatment failure is noted with traditional DMARDs.[2] Receiving DMARDs as recommended by the ACR, is also an indication of good-quality care for RA patients.[3]

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In an earlier study (1996–2007) on National Ambulatory Care Medical Survey (NAMCS) by Solomon et al.,[4] the use of any DMARD increased from 45% in 1996 to about 60% in 2005–2007 while the use of bDMARDs increased from 10% in 1996 to ~15% in 2005–2007. Additionally, another study looked at the impact of ACR guidelines (pre- vs. post-2008) on RA prescription patterns, and noted that among patients with low disease activity, the use of traditional DMARDs was about 91–93% and the adherence to ACR guidelines among this population was optimal.[5] Although the initiation of bDMARDs for moderate-to-severe disease activity increased from 13–16% (pre-2008) to 15–16% (post-2008), the overall use of bDMARDs was found to be around 20–33%.[5] This indicated moderate adherence to ACR guidelines among those with moderate-to-high disease activity. Even though previous studies have found that treatment with DMARDs (including bDMARDs) has increased among RA patients as compared to other treatments, such as glucocorticoids and pain medications, the overall use of bDMARDs is suboptimal.[4–6] Previous studies have concluded that race/ethnicity, provider type (general physician vs. specialist) and type of drug coverage are factors associated with DMARD use among RA patients.[7–9] Solomon et al.[4] concluded that in NAMCS, most RA visits were not associated with DMARD prescription while African Americans and those who visited a general physician, were less likely to receive DMARDs. The study by Solomon et al., was one of the first studies to provide DMARD use estimates using a nationally representative data. However, this study did not focus on factors associated with bDMARD use and did not consider type of coverage as one of the factors associated with DMARD use.

Therefore, this study aims to provide new information on prevalence of traditional and biological DMARD use using recent-most NAMCS data. We plan to assess the association of type of coverage in addition to previously studied factors such as type of provider and patient race/ethnicity.

Materials and methods

Data source

The National Ambulatory Medical Care Survey (NAMCS) is a publicly available data collected through a national survey designed for information on the utilization and provision of ambulatory care services in hospital emergency and outpatient department visits. The data source is a nationally representative probability sample of office-based physician practices and outpatient settings across the US that uses a multistage cluster strategy to select physicians in hospital and outpatient settings by geographic location and provider specialty.

Study design and population

We studied all the visits recorded in the NAMCS data with a RA diagnosis using the following diagnosis codes—714.0, 714.1, and 714.3. We included adults (≥18 years) who had a record of RA among the first three diagnoses recorded per visit in the database. We pooled the NAMCS data and the emergency department (ED) files for 2005–2014 and the OPD visit files from 2005 to 2011 for a cross-sectional study design to examine the factors associated with DMARD and biological DMARD use.

Dependent variables

We looked at up to eight new or ongoing medications recorded per visit for RA treatment as the dependent variable. These treatments included any DMARD treatment (traditional or biological), NSAIDs, and glucocorticoids. The visits associated with traditional DMARDs, such as methotrexate, hydroxychloroquine, sulfasalazine, and minoclycline and those with biological DMARDs, such as infliximab, etanercept, adalimumab, certolizumab, abatacept, tocilizumab, and tofacitinib, were included. The primary dependent variable in our analysis was any DMARD treatment compared to no treatment or treatment with NSAIDs and/or glucocorticoids only. Any DMARD use included traditional or biological DMARDs and its combination with NSAIDs and glucocorticoids. Additionally, we analyzed the use of biological DMARDs or its combinations compared to no treatment, treatment with traditional DMARDs, and its combinations or NSAIDs and/or glucocorticoids only.

Independent variables

We used the Andersen Behavioral Model to guide the selection of variables that included predisposing (age, gender, and race/ethnicity), enabling (type of health insurance coverage, type of provider, and geographic region), and need (number of comorbidities).

We categorized the age groups as less than 45 years, between 45 and 59 years, and 60 years and over. We compared the DMARD use among non-Hispanic White, non-Hispanic Black, Hispanic, and others. We considered the following geographical regions in our analysis—Northeast, Midwest, South, and West. We categorized the type of health insurance as private insurance, Medicare, Medicaid, self-pay, and other, while the type of provider as general physician vs. specialist. Further, we

Table 1
Distribution of characteristics among any DMARD and biological DMARD (bDMARD) treatment visits

Characteristics	Any DMARD treatment, *N* (%)[a,b]	bDMARD treatment, *N* (%)[a,b]
Age group		
< 45 years	143 (62.3)	63 (31.9)
45 to < 60 years	287 (66.4)	118 (26.8)
≥60 years	377 (56.6)	153 (20.9)
Gender		
Male	**637 (63.5)**	260 (25.2)
Female	**170 (50.4)**	74 (19.6)
Race/ethnicity		
Non-Hispanic White	565 (60.9)	233 (23.7)
Non-Hispanic Black	83 (51.2)	21 (22.3)
Hispanic	108 (63.5)	55 (28.2)
Other	44 (64.7)	23 (18.5)
Health insurance		
Private insurance	**328 (71.5)**	**156 (32.3)**
Medicare	**270 (52.5)**	**102 (15.3)**
Medicaid	**105 (59.9)**	**35 (20.2)**
Self-pay	**28 (50.4)**	**9 (24.6)**
Other	**39 (67.2)**	**12 (27.4)**
Type of provider		
General physician	**661 (64.0)**	**293 (26.6)**
Specialist	**146 (43.3)**	**41 (10.8)**
Geographic region		
Northeast	165 (58.2)	66 (29.6)
Midwest	186 (57.7)	86 (22.0)
South	284 (64.6)	100 (19.8)
West	172 (57.8)	82 (27.5)
Number of chronic comorbid conditions		
3 or more	**580 (65.9)**	252 (26.3)
Less than 3	**227 (51.9)**	82 (20.0)

Bolded values indicate $p < 0.05$ according to chi-square test.

[a]Percentages are weighted.

[b]Percentages have been rounded to single decimal point.

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