Patient Characteristics And Management Of Juvenile Idiopathic Arthritis (JIA) In a Large, Representative Real-World Cohort

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Background

- Chronic arthritis of any type is estimated to affect approximately 300,000 children in the US, although estimates vary widely
- Juvenile idiopathic arthritis (JIA), diagnosed in children under age 16, can manifest as morning stiffness, joint pain & tenderness, fever, rash and uveitis
- The course of JIA subtypes is variable, with some patients achieving remission and up to a third of patients converting to a persistent course into adulthood[1]
- Treatment with conventional disease-modifying antirheumatic (cDMARD) and biologic DMARDs (bDMARDs) is increasingly common
- Increased risk of cardiovascular disease (CVD) is commonly seen in adult rheumatic diseases but is poorly characterized in the in JIA population[2]

Objectives

- To describe the pediatric population diagnosed with JIA in the US by characterizing demographic and clinical characteristics
- To describe the sub-population of JIA patients who are treated with bDMARDs

Methods

- A cohort of JIA patients was identified in the OM1 Real-World Data Cloud (OM1, Boston, MA), an ongoing, continually enrolling, representative sample of over 240 million patients in the US. The combined electronic medical record data (EMR) and administrative claims dataset was used to assess demographic, clinical and treatment information and provide longitudinal insights into the complete patient journey
- ICD and SNOMED diagnosis codes were used to identify patients with key clinical manifestations. NDC and CPT procedure coded medication orders and prescription fills were used to identify cDMARDs and bDMARDs for JIA
- Data from January 2013 - September 2019 were utilized
- Cohort included patients <20 years who met criteria of at least two JIA related outpatient diagnosis codes within a 1 year period, one JIA-related inpatient encounter or ≥2 diagnosis codes by a rheumatologist

Results

- A total of 30,925 JIA patients with a mean age (standard deviation) of 11.6 (4.9) years were identified
- Majority of patients were female (70.0%) and white (88.2%) (**Table 1**)
- Most patients were characterized as polyarticular (67.4%) and 10.1% of patients were documented as having systemic onset of JIA (**Table 1**)
- Uveitis was documented in 3,843 patients (12.4%)
- Approximately 17.5% of patients were treated with at least one bDMARD, including tumor necrosis factor alpha inhibitors (TNFa, 13.2%), IL-6 inhibitors (3.2%) and JAK inhibitors (0.4%) and 11.5% with cDMARDs. The most common cDMARD utilized was methotrexate (7.2%).
- Treatment with bDMARDs was more common in older patients (age <6 11.2%; age 6-11 15.6%; age ≥12 20.3%) **(Table 1)**.
- A slightly higher proportion of female patients were treated with bDMARDs (18.0% versus 16.4% male) or cDMARDs (11.9% vs. 10.4% male)
- Psoriasis, depression, uveitis, osteoporosis, hypertension, and inflammatory bowel disease (IBD) were more common among patients treated with bDMARDs. The proportion of patients with diabetes and asthma was similar for those treated with bDMARDs and those not treated with bDMARDs. (**Figure 1**)
- While the distribution of BMI-for-age percentiles was similar across bDMARD treated and untreated groups at the time the earliest BMI was recorded (**Figure 2**), a higher proportion of patients treated with bDMARDs had a maximum BMI value in the 75-100th percentile (**Figure 3**)

Table 1. Demographic Characteristics

	All Patients N=30,925	Treated with bDMARDs N=5,426	Not Treated with bDMARDs N=25,499
Age at first recorded encounter, n (%)			
≤5	4,771 (15.4)	536 (9.9)	4,235 (16.6)
6-11	8,920 (28.8)	1,390 (25.6)	7,530 (29.5)
≥12	17,234 (55.7)	3,500 (64.5)	13,734 (53.9)
Sex, n (%)			
Female	21,644 (70.0)	3,903 (71.9)	17,741 (69.6)
Male	9,281 (30.0)	1,523 (28.1)	7,758 (30.4)
Race, n (%)			
White	5,224 (88.2)	1,376 (87.4)	3,848 (88.5)
Black	565 (9.5)	153 (9.7)	412 (9.5)
Other	136 (2.3)	46 (2.9)	90 (2.1)
Unknown	25,000	3,851	21,149
JIA disease subtype†, n (%)			
Polyarticular	20,835 (67.4)	4,404 (81.2)	16,431 (64.4)
Systemic	3,126 (10.1)	678 (12.5)	2,448 (9.6)
Pauciarticular	10,122 (32.7)	1,510 (27.8)	8,612 (33.8)
Psoriatic arthritis	1,246 (4.0)	367 (6.8)	879 (3.4)
cDMARD use, n (%)	3,566 (11.5)	1,344 (24.8)	2,222 (8.7)

†Patients may have more than one disease type recorded; percents do not sum to 100.

Figure 1. Proportion of Patients with Select Comorbidities by bDMARD Treatment Status

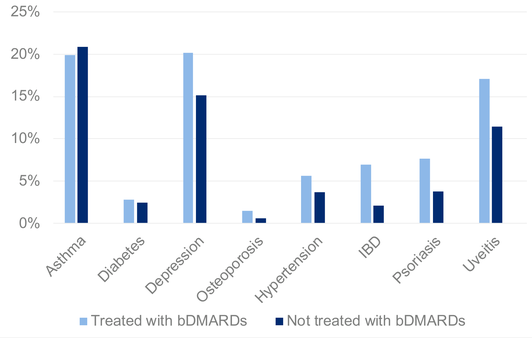


Figure 2. Earliest recorded BMI-for-age percentile in patients <18 year of age by treatment group

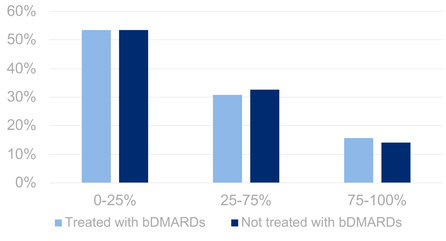
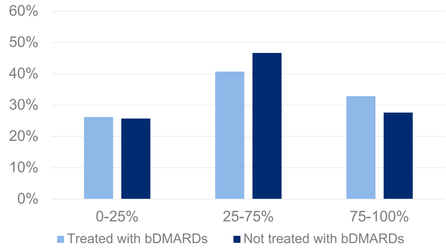


Figure 3. Maximum recorded BMI-for-age percentile in patients <18 year of age by treatment group



Conclusions

- The increasing use of bDMARDs in JIA may have long term ramifications for JIA patients with sustained disease related to steroid-sparing and cardiovascular risk associated with systemic inflammation. Longer term follow-up is warranted.
- The proportion of JIA patients with a diagnosis of diabetes (2.5%) was 10 times higher than in the general US population under the age of 20 (0.24%[3]). This finding has significant implications for understanding the CVD risk profile of JIA patients.
- CVD risk factors such as hypertension and high BMI were seen more frequently in patients treated with bDMARDs, indicating that patients should be monitored for signs of increased CVD risk even when treated with bDMARDs.
- Given the benefit risk considerations, the more frequent use of bDMARDs in pediatric patients with more severe disease was expected. These patients in particular should be monitored closely for cardiometabolic risk factors, mental health issues, and other comorbidities that may have a significant impact on longer term outcomes and quality of life.

References

1. Minden K, Niewerth M, Listing J, et al. Long-term outcome in patients with juvenile idiopathic arthritis, Arthritis Rheum ,2002;46:392-401
2. Coulson EJ, Ng WF, Goff I, Foster HE. Cardiovascular risk in juvenile idiopathic arthritis. Rheumatology 2013;52(7):1163-1171.
3. Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2017. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2017.

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