

Age-Related Differences in Persistence with Standard-of-Care Treatment for Generalized Myasthenia Gravis in the United States

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Background

Generalized myasthenia gravis (gMG) requires long-term treatment to maintain disease control and reduce risk of acute clinical events (exacerbation and crisis)¹

Standard of care for gMG includes acetylcholinesterase inhibitors, systemic corticosteroids, and non-steroidal immunosuppressants²

Treatment persistence may be impacted by age-related factors including growing autonomy in adolescence and shift to independence alongside insurance and care transitions in young adulthood³⁻⁵

Little is known about persistence on standard of care among children, adolescents, and young adults with gMG

Objective

To assess treatment persistence on standard of care among children, adolescents, and young adults compared with adults with gMG in the United States

Results

Patient characteristics

- The study included 13,957 patients with gMG initiating standard of care: 145 children (60% female), 159 adolescents (63% female), 531 young adults (72% female), and 13,122 adults (48% female; Table 1)

Table 1. Baseline characteristics

Mean ± SD [median] or n (%)	Children N=145	Adolescents N=159	Young adults N=531	Adults N=13,122
Age at index date (years)	6.6 ± 3.2 [6.0]	14.9 ± 1.7 [15.0]	24.1 ± 3.5 [24.0]	63.9 ± 13.8 [65.0]
Female	87 (60.0)	100 (62.9)	384 (72.3)	6,297 (48.0)
Race/ethnicity				
White	41 (28.3)	45 (28.3)	194 (36.5)	8,697 (66.3)
Hispanic or Latino	26 (17.9)	24 (15.1)	70 (13.2)	1,068 (8.1)
Black or African American	22 (15.2)	36 (22.6)	73 (13.7)	1,006 (7.7)
Asian or Pacific Islander	5 (3.4)	1 (0.6)	22 (4.1)	365 (2.8)
Other	5 (3.4)	3 (1.9)	20 (3.8)	335 (2.6)
Unknown	46 (31.7)	50 (31.4)	152 (28.6)	1,651 (12.6)
Geographic region				
Midwest	48 (33.1)	38 (23.9)	141 (26.6)	3,666 (27.9)
South	40 (27.6)	60 (37.7)	180 (33.9)	4,407 (33.6)
Northeast	38 (26.2)	34 (21.4)	116 (21.8)	3,145 (24.0)
West or unknown	19 (13.1)	27 (17.0)	94 (17.7)	1,904 (14.5)
Payer				
Medicaid	77 (53.1)	58 (36.5)	128 (24.1)	726 (5.5)
Commercial	67 (46.2)	99 (62.3)	390 (73.4)	6,072 (46.3)
Medicare Advantage or unknown	1 (0.7)	2 (1.3)	13 (2.4)	6,324 (48.2)
Index year				
2018–2019	36 (24.8)	57 (35.8)	162 (30.5)	3,927 (29.9)
2020–2021	45 (31.0)	40 (25.2)	143 (26.9)	3,647 (27.8)
2022–2023	41 (28.3)	47 (29.6)	181 (34.1)	3,882 (29.6)
2024–2025	23 (15.9)	15 (9.4)	45 (8.5)	1,666 (12.7)
Any diagnosis for weakness, malaise or fatigue ^a	128 (88.3)	134 (84.3)	442 (83.2)	11,500 (87.6)
Any diagnosis for autoimmune disorder other than gMG ^b	3 (2.1)	12 (7.5)	97 (18.3)	2,678 (20.4)
Number of unique gMG-related agents	0.9 ± 1.0 [1.0]	0.7 ± 0.9 [0.0]	1.1 ± 1.1 [1.0]	1.2 ± 1.1 [1.0]
≥1 MG exacerbation	59 (40.7)	50 (31.4)	173 (32.6)	4,306 (32.8)
≥1 MG crisis	9 (6.2)	3 (1.9)	14 (2.6)	238 (1.8)
Class of index standard of care ^c				
Acetylcholinesterase inhibitor	113 (77.9)	133 (83.6)	360 (67.8)	8,759 (66.8)
Systemic corticosteroid	46 (31.7)	46 (28.9)	208 (39.2)	5,025 (38.3)
Non-steroidal immunosuppressant	1 (0.7)	5 (3.1)	39 (7.3)	1,121 (8.5)

Abbreviations: gMG = generalized myasthenia gravis; MG = myasthenia gravis; SD = standard deviation.

Notes:

^a This includes diplopia, dysarthria, dysphagia, dyspnea, general and other muscle-specific weaknesses, malaise and fatigue, and ptosis.

^b Other autoimmune comorbidities included rheumatologic, dermatologic, neurologic, gastrointestinal, endocrine, and thymic autoimmune disorders.

^c Index standard of care was identified based on claims on the index date and not mutually exclusive.

Methods

Study design and data source

- This retrospective, observational study used administrative claims from Komodo Research Data (KRD+) from January 1, 2017 to May 31, 2025
- The index date was the date of standard of care initiation
- Patients were stratified into 4 cohorts based on age at index date (children: 2–11; adolescents: 12–17; young adults: 18–29; adults: ≥30 years old)
- The baseline period consisted of 12 months preceding the index date and was used to assess patient characteristics
- The follow-up period spanned the index date until the earliest of index treatment discontinuation, end of continuous insurance eligibility, or end of data availability

Patient selection criteria

- ≥1 inpatient admission with an MG diagnosis (International Classification of Diseases, Tenth Revision, Clinical Modification: G70.00, G70.01 or G70.2) or ≥2 outpatient visits with an MG diagnosis ≥30 days apart
- ≥1 MG diagnosis by a neurologist
- ≥12 months of continuous insurance eligibility prior to the first neurologist-diagnosed MG (i.e., wash-out period to identify incident gMG)
- ≥1 claim for standard of care after the first neurologist-diagnosed MG and within the same continuous insurance eligibility period; the first claim for any standard of care defined the index date
- ≥2 years old on the index date

Statistical analysis and outcomes

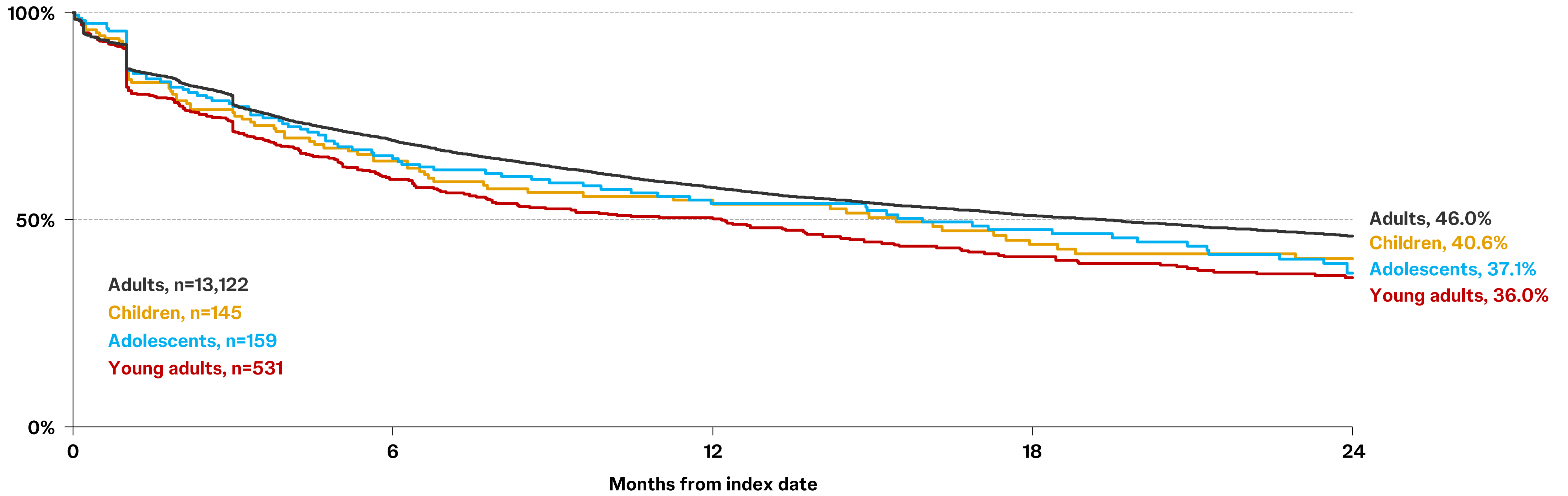
- Persistence on standard of care was defined as the absence of a treatment exposure gap ≥60 days in days of supply of any standard-of-care treatment (i.e., ×2 the typical prescription supply interval of 30 days) and was evaluated across standard-of-care treatment classes without requiring persistence on the index agent; the last day of supply before the gap defined the discontinuation date
- Persistence time was measured from the index date until discontinuation; patients without discontinuation were censored at the end of their follow-up period
- The Kaplan-Meier (KM) analysis was used to describe persistence for each cohort based on the age groups defined at index date
- Because KM analysis does not allow patients to move into older age groups as they age during follow-up, a multivariable Cox proportional hazards model with time-varying age group was used to compare persistence in childhood, adolescence, and young adulthood against adulthood (reference category); the model adjusted for sex, race, payer at index date and index year, baseline number of unique conditions related to weakness or fatigue, autoimmune disorders other than gMG, Charlson Comorbidity Index, number of unique gMG-related treatments, and prevalence of gMG acute clinical events

Persistence

- The mean follow-up duration was 29.7, 34.6, 24.3, and 28.1 months among children, adolescents, young adults, and adults, respectively
- Based on patients' age group at index date, persistence on standard of care at 24 months was 40.6%, 37.1%, 36.0%, and 46.0% among children, adolescents, young adults, and adults, respectively (Figure 1)

Figure 1. Persistence on standard of care

Percentage of patients remaining on standard of care



	6 months	12 months	18 months	24 months
At risk ^a , n (%)				
Adults	7,522 (57.3)	5,156 (39.3)	3,746 (28.6)	2,727 (20.8)
Young adults	246 (46.3)	172 (32.4)	107 (20.2)	78 (14.7)
Adolescents	93 (58.5)	63 (39.6)	49 (30.8)	32 (20.1)
Children	79 (54.5)	55 (37.9)	40 (27.6)	34 (23.5)
KM rate (95%CI)				
Adults	69.1% (68.3–69.9)	57.8% (56.8–58.7)	51.0% (50.0–52.0)	46.0% (45.0–47.0)
Young adults	59.7% (55.1–64.0)	50.1% (45.4–54.7)	41.0% (36.1–45.9)	36.0% (31.0–41.1)
Adolescents	64.8% (56.6–71.9)	54.0% (45.4–61.8)	47.6% (38.9–55.8)	37.1% (28.4–45.8)
Children	64.2% (55.5–71.6)	53.7% (44.7–62.0)	44.0% (34.7–52.9)	40.6% (31.4–49.6)

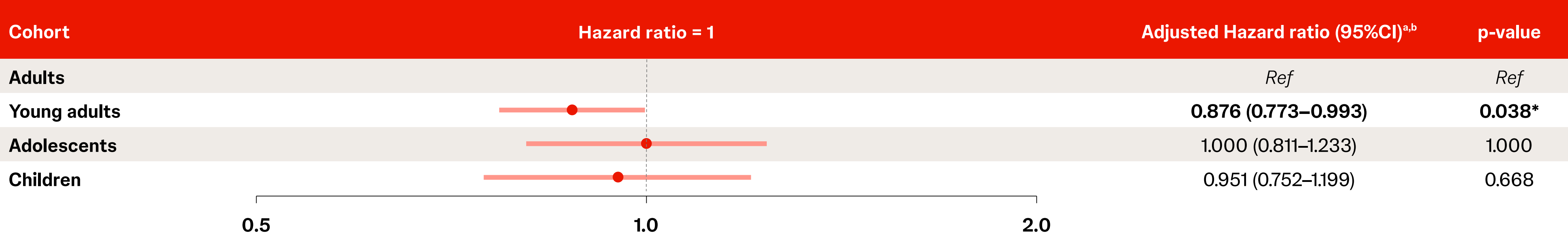
Abbreviations: CI = confidence interval; KM = Kaplan–Meier.

Note:

^a This includes the number and percentage of patients remaining at risk after the given period.

- Based on patients' age group at each point during follow-up, persistence on standard of care was 12% lower during young adulthood compared with adulthood (adjusted hazard ratio: 0.88; p=0.038); there was no statistically significant difference in persistence during childhood and adolescence from adulthood (Figure 2)

Figure 2. Relative persistence on standard of care by time-varying age group



Abbreviations: CI = confidence interval; Ref = reference.

^a denotes p-value <0.05.

Notes:

^{*} Time-varying Cox proportional hazards models were used, allowing patients to contribute person-time to different age groups as they aged. Models were specified in counting process (start–stop) form with discontinuation as the event. Robust (sandwich) standard errors were estimated with clustering at the patient level.

^b The hazard ratio <1 indicates lower persistence on standard of care relative to adults.