Sex differences in limitations in physical functioning and overall quality of life among people living with Myasthenia Gravis from the MGFA Global MG Patient Registry (MGFAPR) in the US

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1. OBJECTIVES

Myasthenia Gravis (MG) is an autoimmune disease characterized by muscle weakness and fatigue[1]. Overall, the incidence of MG is higher in women than men, with an earlier onset in women[2]. MG patients have been reported to experience greater physical and cognitive fatigue[3]. Studies identified sex differences on objective and patient-reported outcomes. This study aims to assess the impact of sex differences on limitations in physical functionalities related to muscle and sensory symptoms impacted by MG[4], disease severity[5] and the overall quality of life (QoL)[2,6] in patients with MG.

2. METHODOLOGY

Myasthenia Gravis Foundation of America Patient Registry (MGFAPR) is an online voluntary longitudinal patient reported MG registry hosted on the Health Storylines platform. The registry collects self-reported data from adult patients (18 years and above at the time of registry enrollment) with MG through online surveys at enrollment and biannual follow-ups. Cross-sectional analyses were performed on data from the enrollment surveys from November 2017 to June 2023. Ordinal logistic regression and Mann-Whitney tests were used to assess the impact of sex differences in the severity of physical functionalities impacted by MG, controlling for age. Disease severity and patient's QoL were assessed with the MG-ADL and MG-QoL-15r scales, respectively. The Minimal clinically important difference (MCID) of MG-ADL is two points[7].

3. RESULTS

Study included 1,314 patients (59% females). Female patients were on average 15 years younger than males at diagnosis (45 vs. 60 years respectively, p<0.001), with a longer disease duration (10.0 vs 7.6 years, respectively, p<0.001) at time of enrollment in the MGFAPR (Table 1). MG-ADL (p<0.001) and MG-QoL-15r (p<0.001) scores were higher in female than male MG patients at enrollment (Table 2 and Figure 2).

Female patients with MG had **statistically significant (p<0.001) greater odds of severe to total limitation (Figure 1)** for **bladder control** (OR=2.41, CI=1.93,3.00), **body pain** (OR=2.46,CI=1.98,3.07), **cognitive function** (OR=2.25, CI=1.81,2.8), **fatigue** (OR=1.9, CI=1.53,2.37), **hand function** (OR=2.15,CI=1.73,2.69), **sensory symptoms of burning, tingling, numbness** (OR=1.74, CI=1.4,2.17), **muscle spasticity and stiffness** (OR=1.52, CI=1.23,1.89) and **walking** (OR=1.88, CI=1.51,2.33).

4. CONCLUSION

- Female patients reported more impaired QoL, greater disease severity (with statistically and clinically significant higher MG-ADL scores), and greater overall limitation in activities of daily living.
- Compared to male patients, female patients with MG had a lower age at diagnosis and statistically significant larger odds of severe to total physical limitations across several functionalities affected by MG.
- Female patients present with an overall symptom burden.
- Understanding the determinants of overall physical health and sex differences of patients with MG would help advance the understanding of MG and reduce the gaps in MG care.

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Table 1: Patient Demographics and Disease Characteristics at Enrollment

	Overall (N=1,314)	Male (N=542)	Female (N=772)
Age at enrollment in years [Mean (SD)]	56.8 (15.0)	63.9 (11.8)	51.7 (15.0)
Disease duration in years [Mean (SD)]	9.1 (9.2)	7.6 (7.0)	10.1 (10.3)
MG diagnosis age in years [Mean (SD)]	51.4 (17.3)	60.1 (13.7)	45.3 (16.9)

Table 2: MG-ADL and MG-QoL-15r Scores in Female and Male Patients at Enrollment

	Overall	Male	Female
MG-ADL			
N	1,313	541	772
Median	7.0	6.0	8.0
Mean (SD)	6.9 (3.8)	5.9 (3.6)	7.6 (3.9)
MG-QoL-15r			
N	1,312	541	771
Median	14.0	12.0	16.0
Mean (SD)	14.1 (7.6)	12.1 (7.3)	15.5 (7.5)

Figure 1: Odds Ratio (OR) and 95% Confidence Intervals for MG Functionalities by Gender at Enrollment

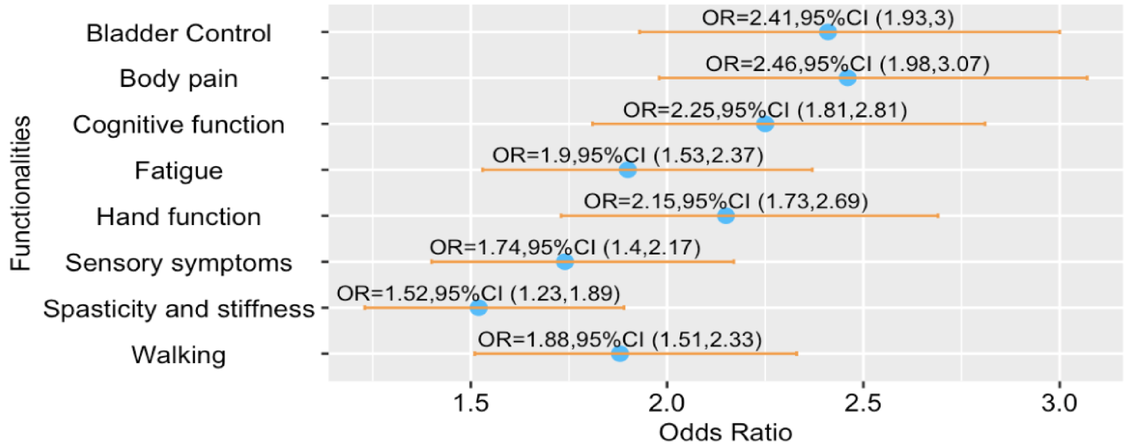
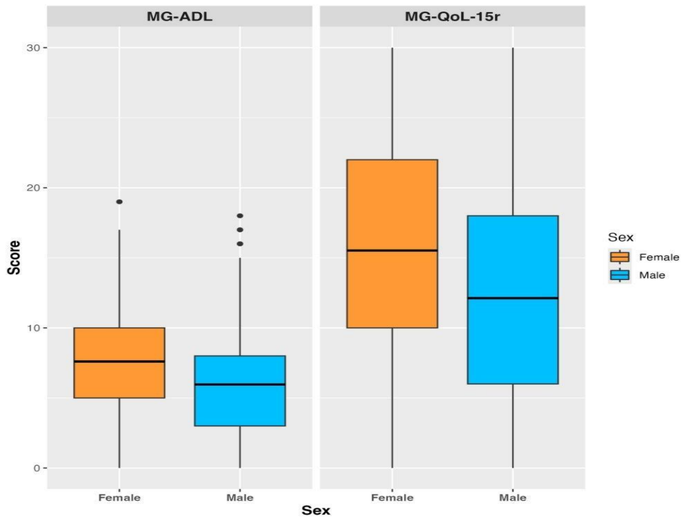


Figure 2: Distribution of MG-ADL and MG-QoL-15r Scores for Female and Male Patients at Enrollment



Note: Higher scores indicate greater disease severity (MG-ADL) and lower quality of life (MG-QoL-15r)

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