Characterization of adult patients with myasthenia gravis using French rare disease registry (BNDMR)

RWD81

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INTRODUCTION

- Generalized myasthenia gravis (MG) is a rare autoimmune disorder of the neuromuscular junction characterized by fluctuating muscle weakness (Gilhus et al., 2019, Vincent et al., 2001). The clinical presentation of MG is highly variable, in terms of severity, fatigue threshold, stability over time, and the groups of involved muscles (Vincent et al., 2001).
- A recent meta-analysis of epidemiological studies published up to 2020 estimated the prevalence of MG at 124 cases per million [95% confidence interval: 10.6 – 14.5] (Salari et al., 2021).
- The interest of using the French rare disease registry database as a complementary approach is that the diagnosis of MG is made by physicians with expertise in neuromuscular disease and is thus more reliable.

OBJECTIVE

- This study aims to describe the characteristics of patients with Myasthenia Gravis (MG) using data from the French rare disease registry database, Banque Nationale de Données Maladies Rares (BNDMR).

METHODS

- A retrospective cohort study was conducted using the BNDMR. The BNDMR is a national database of patients with rare diseases whose care is managed by national reference centres (Jannot et al., 2022). These reference centres were established by the French Health Ministry in order to centralise the management of patients with rare diseases and to promote optimal standards of care. There are reference centres for neuromuscular diseases distributed across France, which coordinate care of patients with MG (FILNEMUS Network).
- The BDNMR contains data on demographic characteristics, diagnosis and disease history.
- Patients were selected based on presence of:

(1) ≥1 confirmed diagnosis of MG with the ORPHA codes 589 (autoimmune myasthenia) or 391490 (autoimmune myasthenia of adults),

(2) ≥1 visit in a referent center between Jan 2007 and Dec 2021,

(3) adult patients (≥18 years),

(4) non opposed for data reuse.

- The index date was defined as the date of the confirmed or probable MG diagnosis for patients diagnosed during the inclusion period, or by the date of the first care for patients diagnosed prior to the inclusion period.
- Patients were followed from the index date to the end of data collection or death.
- Extracted variables were demographic characteristics, diagnosis and disease history.

LIMITS

- Incomplete data: Patients treated outside of expert centers are not included reflecting minimal prevalence.
- Non-uniform data collection: Data is not collected consistently across all regions.
- Overestimated survival rates: Vital status is derived from patient identity data, which may be inaccurate, leading to an underestimation of deaths (up to 10%).

CONCLUSION

Characteristics of overall MG patients were consistent with existing literature. The observed prevalence of MG is lower than previously reported, likely due to the study's focus on patients with at least one visit to a referent center. The cohort is representative and includes diagnosis certainty documented by 19 referent centers.

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RESULTS

Patient selection

After application of the inclusion criteria, 3,963 patients with MG were identified in BNDMR (Figure 1).

Baseline demographics and clinical characteristics

Baseline demographics and clinical characteristics were largely consistent with previous reports. (Table 1).

In the BNDMR population, the mean age of the patients was 58.0 ± 18.0 years and 44.3% were men.

Mean age of women was younger (55 years) with a distribution showing 2 sub-cohorts (<40 years versus >40 years) (Figure 2).

Figure 1: Patient selection flowchart

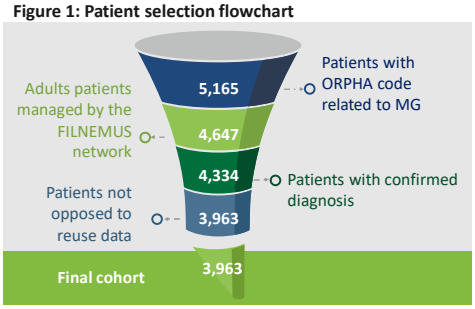
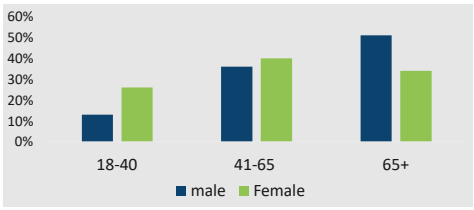


Table 1: Patient demographics and baseline characteristics

	MG cohort (N=3,963)
Follow-up year (Mean, SD)	6,1 (3,8)
Follow-up year (Median, IQR)	5,7 (3,0-8,8)
Age at index date (Mean, SD)	58 (18)
Age at index date (Median, IQR)	61 (44-73)
Distribution by age, n (%)	
18–40	787 (20)
41–65	1,517 (38)
65+	1,659 (42)
Gender, n (%)	
Male	1,754 (44)
Female	2,208 (56)
Distribution by age for women, n (%)	
18–40	567 (26)
41–65	882 (40)
65+	760 (34)
Distribution by age for men, n (%)	
18–40	220 (13)
41–65	635 (36)
65+	899 (51)
Age at diagnosis (Mean, SD)	51 (19)
Age at diagnosis (Median, IQR)	52 (35-68)

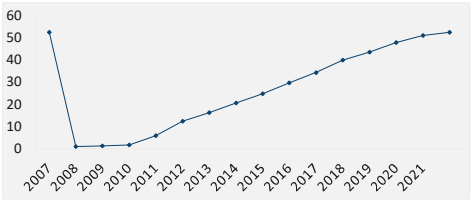
Figure 2: Patients by age group and gender



Prevalence

In the BNDMR database, the number of MG cases recruited in the reference centers accumulated progressively following the creation of the database in 2007 to reach 3,529 patients in 2021, corresponding to a crude prevalence rate of 52.2 [50.5 – 53.9] cases per million in 2021 (Figure 3).

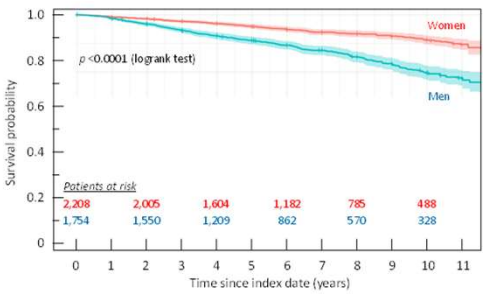
Figure 3: Prevalence (cases per million)



Mortality

In the BNDMR population, a total of 434 patients died over the eleven-year observation period (11.0%). Survival probabilities were 92.2% at five years and 82.7% at ten years (94.9% and 89.1% respectively in women and 88.9% and 74.6% respectively in men). Kaplan-Meier survival curves for men and women in the BDNMR are presented in Figure 5.

Figure 5: Kaplan Meier survival analysis



Discussion

Consistent with previous reports, we observed a higher prevalence of MG in women than in men up to 65 years, with the gender predominance reversing thereafter (Vincent et al., 2001). We also observed regional disparity in the prevalence of MG, similarly to other autoimmune diseases in France such as multiple sclerosis and Crohn's disease, which both increase along a South-West to North-East axis (Foulon et al., 2017, Nerich et al., 2006).

Regional prevalence

In terms of regional variation, the prevalence was lowest in the North-West (Brittany and Normandy) and highest in the South-East (Provence and Corsica) (Figure 4).

Figure 4: Regional variation of the standardised prevalence of MG in France and overseas French territories