

INTRODUCTION

The most recent incidence and prevalence rates in Hungary were determined nearly a decade ago, primarily based on hospital discharge records. This research adopts a comprehensive approach to define and characterize the patient population, utilizing additional medication and inpatient care data from the National Health Insurance Fund (NHIF) claims database.

CONCLUSIONS

The initial findings from our research on the Hungarian myasthenia gravis (MG) population indicate that patient distribution aligns closely with international age and sex epidemiology. Alongside thorough specialist follow-up, we observed a high prevalence of medication use and outpatient care. However, the costs associated with MG care are highly concentrated; a small subset of patients accounts for over half of the expenses due to high fees for services such as IVIG, PLEX, rituximab, and mechanical ventilation. Further research is necessary to explore the structure and overlap of these subgroups.

METHODS

The analysis utilized anonymized data.

- The NHIF database encompasses all reimbursement events and primary demographic data for patients, covering Hungary's total population of appr. 9.6 million.
- The research period: January 1, 2017, to December 31, 2022.
- Results were summarized using descriptive, unadjusted statistics generated via PL/SQL Developer 14.0.

- Costs based on official list prices; discounts and rebates on individual purchases were not considered.
- The average euro (€) exchange rate: €1 = 381.9 HUF (January to December 2023)
- Limitation: Individual patient-level data cannot be provided; only aggregated data is available.

Inclusion criteria's

- Patients with at least five prescriptions for pyridostigmine (ICD code G70) during the research period who also met at least one of the four conditions illustrated in the accompanying figure.
- Patients without five pyridostigmine prescriptions but with at least three steroid prescriptions coded as G70 during the research period.

RESULTS

Epidemiology

The average incidence rate was 18%, translating to approximately 229.6 incident patients per year. Throughout the research period, 1,979 patients were identified, with a slight predominance of women (1,052) over men (907). Notably, 38% of patients were over 70 years of age, which contributes to the lower proportion of men, as this age group is associated with a higher local mortality rate.

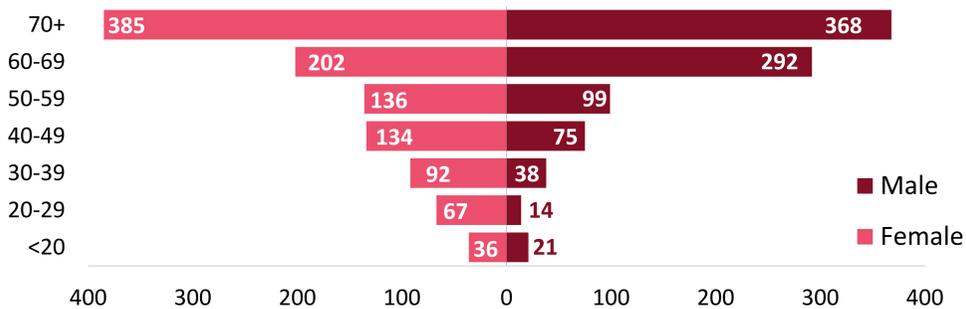


Figure 1 - Sex and age distribution of the MG patients

Direct healthcare cost, and health resource utilisation (HRU)

Table 1 presents key descriptive statistics for each overlapping patient group by age and annual cost, segmented by healthcare level. The Hungarian MG patient population displays a consistent profile across different healthcare service providers, with patients receiving rituximab being younger than those in other subgroups, and generally, a slightly higher number of women across all groups. The total annual direct healthcare cost for the NHIF is €1,002,033, encompassing 15,698 HRU cases. The average direct cost per case was €63.80.

Patients requiring hospitalization, constituting 2.8% of the average annual case count, account for nearly two-thirds of the total costs (65.8% or €659,090). Immunomodulatory treatments, including IVig, PLEX, rituximab, and mechanical ventilation, represent the most costly expense components. Prescription fulfillment, which encompasses more than two-thirds (67.1%) of cases, contributes 29% of average annual costs, indicating that a considerable proportion of patients are effectively managed with long-established essential drug therapies (such as pyridostigmine) available for MG.

In Hungary, the administration of pyridostigmine is initiated by a neurologist. The observed prevalence of cases (31.3%) and the low annual expenditure rate (5.2%) in outpatient care support this assertion, alongside the presence of a specialist supervisory role.

Category by level of healthcare	Total population (n=1959)	Prescription fulfilment (n=1959)	Outpatient (n=1850)	Inpatient (n=1114)				
				All costs	Mech. ventilation (n=203)	PLEX (n=372)	IVIG (n=122)	Rituximab (n=74)
Male, n (%)	907 (46)	907 (46)	864 (47)	487 (44)	97 (46)	170 (46)	57 (47)	27 (46)
Age								
Mean	58	60	57	57	58	57	57	50
Median	63	64	62	63	64	63	59	48
Case per year, n (%)	15 698 (100)	10 534 (67)	4 917 (31)	432 (3)	50 (0,3)	304 (2)	45 (0,3)	67 (0,4)
Costs								
Sum cost per year n (%)	€1 002 033 (100)	€290 871 (29)	€52 071 (5)	€659 091 (66)	€90 46 (9)	€188 236 (19)	€169 556 (17)	€90 264 (9)
Avg cost per year	€64	€28	€11	€1 526	€1 815	€619	€3 796	€1 355

Table 1 - Descriptive statistics and yearly healthcare cost by level of healthcare

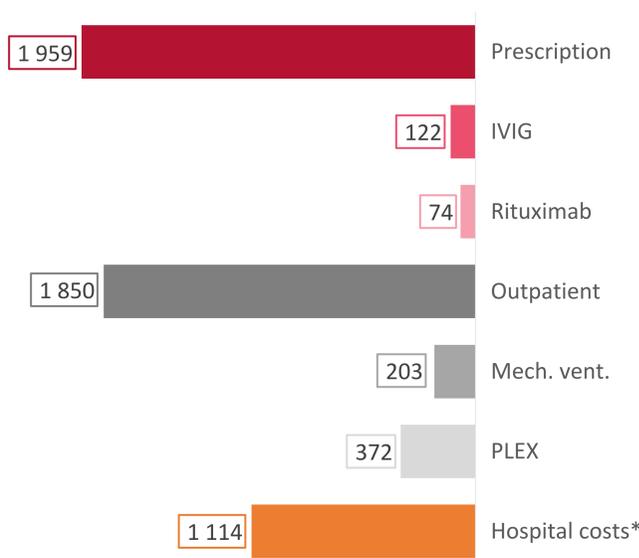


Figure 2 - Patient number by function categories

*other hospital expenditure not included in the above categories

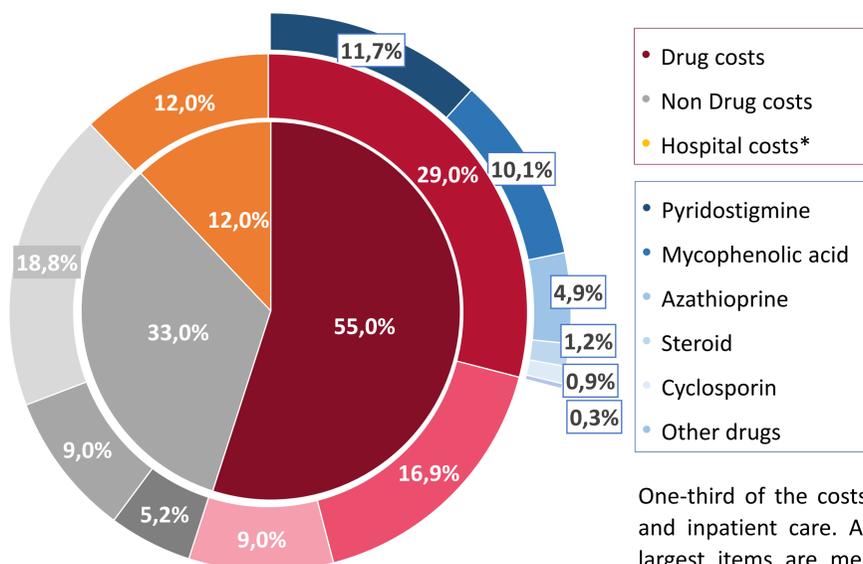


Figure 3 - Average cost by function categories

Cost distribution from a functional perspective, demonstrating the composition of drug and non-drug expenditures. The NHIF allocates a remarkable portion of its budget to pharmaceuticals, with expenditures reaching 55% of the total budget. Prescription accounts for 29% of costs, affecting all patients. Expenditures on IVIG and rituximab are concentrated among a smaller patient population (122, 74), comprising 26% of total expenditure.

One-third of the costs are associated with non-medical outpatient and inpatient care. Among non-pharmaceutical expenditures, the largest items are mechanical ventilation (9%) and PLEX (18.8%), which affect a more limited subset of patients.

Category by function	Total cost per year	Total costs %	Subcategory	Total cost	Total costs %	Patient number	Patient number %
Drug costs	550 691 €	55%	Prescription (n=1959)	290 871 €	29%	1 959	100%
			IVIG (n=122)	169 556 €	17%	122	6%
			Rituximab (n=74)	90 264,0 €	9%	74	4%
			Outpatient (n=1850)	52 071 €	5%	1 850	94%
Non Drug costs	451 342 €	45%	Mech. ventilation (n=203)	90 464 €	9%	203	10%
			PLEX (n=372)	188 236 €	19%	372	19%
			Hospital costs*	120 571 €	12%	1 114	57%

Table 2 - Healthcare cost by level of healthcare

