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PREVALENCE AND ECONOMIC BURDEN OF MAJOR COMORBIDITIES IN MULTIPLE SCLEROSIS

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BACKGROUND

- Comorbidity is common and is associated with higher mortality and increased health care utilization in the general population
- It may account for observed heterogeneity and severity in people with Multiple sclerosis (pwMS), yet its effect has only recently received attention [1].
- The reported prevalence of comorbidity in pwMS varies widely
- The identification of comorbidity through the review of medical records is a time consuming and costly process; the use of population-based administrative data is one of the few validated assessment alternatives [2].
- It is also known that medication and total healthcare costs are generally increased in persons with comorbidities; anyway, data on healthcare costs in pwMS are sometimes confusing and partly inconsistent [3,4].
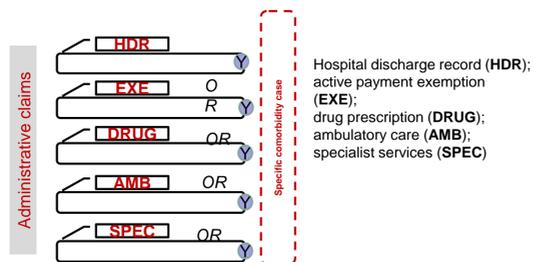
AIMS

- To estimate the prevalence and economic burden of major comorbidities in people with MS (pwMS) in two Northern Italy study areas (Pavia, PV and Genoa, GE)
- To analyse demographic factors related to presence of comorbidity in pwMS using routinely collected healthcare data

METHODS

- We estimated **prevalence of comorbid conditions in pwMS (2012-2017)**: anxiety, depression, cancer, leukemia, lymphoma, hypertension, heart disease, cerebrovascular diseases, vascular diseases, ischemic stroke, hyperlipidaemia, bronchopathy, diabetes, gastropathy, gastric ulcer, autoimmune diseases, chronic renal failure, connective tissue diseases and HIV/AIDS.

By a specific algorithm currently used for monitoring prevalence of chronic diseases by Italian Local Health Authorities implemented in the BDA system (Banca Dati Assistiti)

Administrative claims — Specific comorbidity case
HDR — O / R / OR / OR / OR — Y
EXE
DRUG
AMB
SPEC

Hospital discharge record (**HDR**); active payment exemption (**EXE**); drug prescription (**DRUG**); ambulatory care (**AMB**); specialist services (**SPEC**)

DRG BDA

- **Economic burden (direct healthcare costs)** was defined by regional and governmental contracts; the aggregated healthcare expenditure was compared between pwMS with/without comorbidity

- Logistic regression models were used to evaluate **the risk of having at least a comorbidity** considering age class, sex, and study area

RESULTS

- The MS cases identified were 2975, 2035 in Genoa and 940 in Pavia
- 64.5% were females (without significant differences between GE and PV, p>0.05)
- 53.5% of pwMS had at least one comorbidity (50.6% GE and 58.4% PV, p<0.001)
- pwMS in Genoa were slightly older (GE median=50 and IQR: 41-60 vs PV median=49 years and IQR: 39-57, p=0.003)
- ✓ The most prevalent comorbidities were depression (31.5%; 95%CI:29.5-33.6%), hypertension (16.0%; 95%CI:14.6-17.5%), cancer (9.9%; 95%CI: 8.9-11.1%), heart disease (5.5%; 95%CI: 4.7-6.4%), cerebrovascular diseases (5.9%; 95%CI: 5.1-6.8%) and diabetes (4.7%; 95%CI: 4.0-5.58%)
- ✓ Comorbidity ranking was similar in the two provinces (Figure 1), although we observed significant differences considering specific prevalence rates
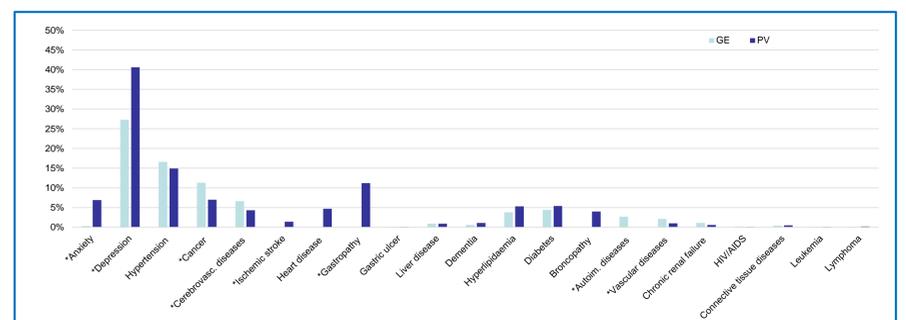

Figure 1. Comorbidity prevalences by center. *statistically significant difference (p<0.05) between GE and PV.

- ✓ The mean direct healthcare costs of MS were substantially higher for individuals with comorbidity (36,779 € vs 26,497 €, p<0.001), showing 28% of additive costs.

- ✓ Presence of comorbidities were significantly less likely among males (OR: 0.76) and more likely in the Pavia area (OR: 1.54) and among older age groups (ORs increased from 1.5 to 10.7 considering the different age classes compared with the youngest) (Figure 2).

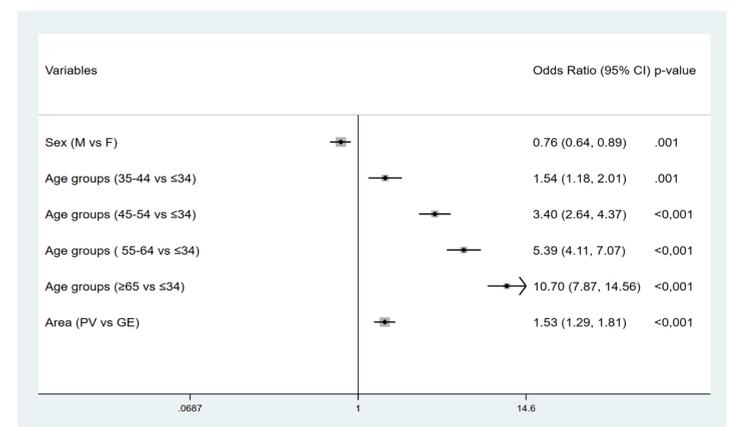| Variables		Odds Ratio (95% CI)	p-value
Sex (M vs F)		0.76 (0.64, 0.89)	.001
Age groups (35-44 vs ≤34)		1.54 (1.18, 2.01)	.001
Age groups (45-54 vs ≤34)		3.40 (2.64, 4.37)	<0,001
Age groups (55-64 vs ≤34)		5.39 (4.11, 7.07)	<0,001
Age groups (≥65 vs ≤34)		10.70 (7.87, 14.56)	<0,001
Area (PV vs GE)		1.53 (1.29, 1.81)	<0,001

.0687 — 1 — 14.6

Figure 2. Forest plot of the multivariable logistic regression model

CONCLUSIONS

- Our study provides evidence of the burden of comorbidities in MS
- Comorbidity is common in MS and produce additive costs
- Our study shows the importance of considering population-based characteristics when evaluating the impact of comorbidities in MS, as prevalence may vary based on age, sex and geographic area
- The use of administrative data for tracking the MS comorbidity could help to improve knowledge
- When an additivity situation is involved, preventive policies could lead to monetary savings

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