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# Initiation of the first disease-modifying treatment for multiple sclerosis patients in the Czech Republic – data from the national registry ReMuS

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## BACKGROUND

The Czech Republic is a medium-sized country with a population of 10,5 million citizens with approx. 20,000 MS patients.

The national registry ReMuS (www.multiplesclerosis.cz) has been collecting data on more than 13,000 MS patients from all 15 MS centers since 2013.

Among others, the data indicates the influence of reimbursement criteria on the accessibility of various disease-modifying drugs (DMD).

## OBJECTIVES

To describe the temporal evolution of treatment commencement in the Czech Republic and estimate factors influencing treatment effect.

## METHODS

- The study included patients starting with **first-line therapy** (glatiramer acetate, interferon beta, teriflunomide) or starting directly with more effective but costlier **escalation therapy** (alemtuzumab, dimethyl fumarate, fingolimod, natalizumab).
- MS patients initiating DMD between 2013-2016 were identified from the respective DMD start date. Based on the huge differences in baseline characteristics of patients starting on different lines of treatment, further analysis was performed only on patients starting with first-line therapy.
- We explored the relationship between the severity of MS before and shortly after DMD start. Probability of having relapse within 1 year after DMD initiation was modelled using logistic regression to access the effect of Expanded Disability Status Scale (EDSS) one year before DMD and the effect of number of previous relapses with regards to other characteristics (age, sex, disease duration). Based on the results of logistic regression, differences in covariates between patients starting therapy in years 2013-2016 were explored using ANOVA.

## RESULTS

- Total of 3,328 patients in the analysis, 3,203 started on first-line therapy and 125 started directly on escalation therapy.
- The proportion of patients starting on escalation therapy increased in time (1.8% in 2013 and 4.7% in 2016) (**Figure 1**).
- The occurrence of a relapse one year after DMD initiation is significantly connected with the EDSS one year before DMD ($p<0.001$, higher EDSS is associated with higher probability of a relapse) and the number of previous relapses ($p<0.001$, patients with ≥2 prior relapses were more likely to have further relapse).
- Both the average EDSS and the number of relapses prior to DMD are significantly lower ($p=0.002$ and 0.018) in patients starting the first DMD in later years of the explored interval (**Table 1**).

**Figure 1. Type of patients starting first DMD each year**

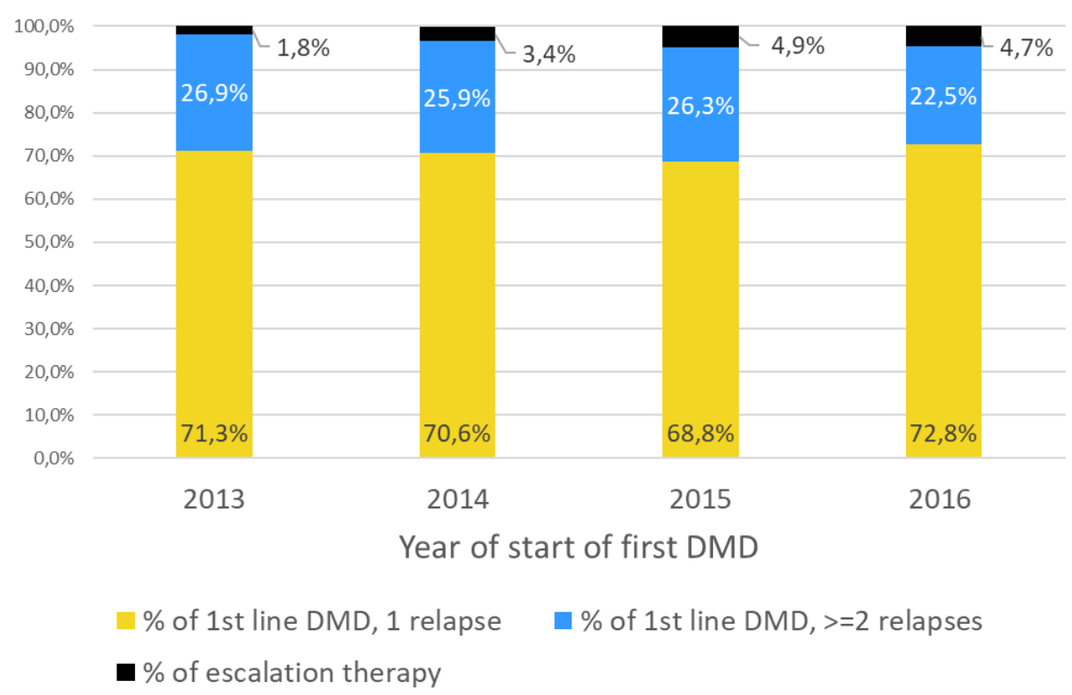


**Table 1. Difference in baseline characteristics of first-line patients starting their first DMD treatment in the years 2013-2016**

| First line DMD (interferons, glatiramer acetate, teriflunomide) patients | | | | | | |
|---|---|---|---|---|---|---|
| Year of start of first DMD | | 2013 | 2014 | 2015 | 2016 | P-value |
| N of patients | | 745 | 744 | 754 | 746 | |
| Gender | % of males | 30.9 | 27.6 | 27.9 | 29.4 | 0.467 |
| Age at first visit | Mean ±SD | 34.71 ± 9.86 | 35.08 ± 10.13 | 35.23 ± 10.11 | 35.14 ± 9.98 | 0.755 |
| Time from onset to start of DMD (years) | Mean ±SD | 2.41 ± 4.60 | 2.24 ± 4.80 | 2.39 ± 4.70 | 2.29 ± 4.94 | 0.889 |
| | Median | 0.50 | 0.42 | 0.47 | 0.44 | |
| EDSS 1 year before DMD | Mean ±SD | 2.15 ± 1.02 | 2.08 ± 0.98 | 1.97 ± 0.95 | 1.97 ± 0.91 | 0.002 |
| N previous relapses (without onset relapse) | Mean ±SD | 0.66 ± 1.33 | 0.58 ± 1.25 | 0.65 ± 1.29 | 0.48 ± 1.10 | 0.018 |

## CONCLUSION

The data from the national registry ReMuS showing decreasing EDSS and number of relapses prior to the first DMD treatment over time evidences the improving management of MS in the Czech Republic. Despite these trends, the rate of patients starting directly on escalation drugs is still low and does not correspond to the estimated number of patients with highly-active disease nor treatment trends in countries with no economic restrictions.

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