Prediction of Long-term Disability in Chinese Patients with Multiple Sclerosis: A Prospective Cohort Study

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Background

Much information about outcomes of multiple sclerosis (MS) has been studied in Caucasian cohorts. However, little is known about the predictors of long-term disability in Chinese patients with MS. The aim of this prospective, observational study is to identify the prognostic factors associated with long-term disability progression (expanded disability status scale, EDSS=6.0) in Chinese patients with relapsing-onset MS.

Methods

Based on data from the MSNMOBase registry within the neurology department of Peking Union Medical College Hospital (PUMCH) in China, this hospital-based cohort study was conducted to estimate the median time of attaining disability endpoint (EDSS = 6.0) by Kaplan-Meier curves, and identify factors that associated with disability progression by Cox proportional regression analysis.

Results

A total of 415 consecutive, eligible patients with MS were registered in the MSNMOBase of PUMCH and prospectively followed from 2011 to 2019. Of these patients, 365 patients with relapsing-onset MS were analyzed. The median time to reach an EDSS of 6.0 was 22.0 (95% CI 16.5-27.5) years. Age at disease onset greater than 50 years (HR 3.846, 95% CI 1.240–11.932, P=0.020), incomplete recovery from first attack (HR 2.107, 95% CI 1.168–3.800, P=0.013), and ≥2 relapses during the first 2 years after onset (HR 2.217, 95% CI 1.148–4.281, P=0.018) significantly associated with a higher hazard ratio to reach an EDSS of 6.0.

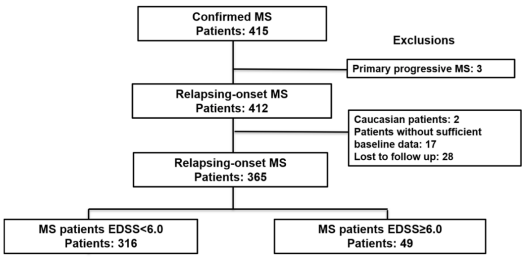

Fig 1. Flow chart of data processing and exclusions

Table 1. Demographic and baseline clinical characteristics in MS patients

Characteristics	
No. of patients	365
Female，No. (%)	246 (67.4)
Age at onset, mean (SD), years	29.8 (10.6)
Disease duration to registration, median (IQR), years	1.7 (0.5, 5.4)
Baseline EDSS score, (range)	1.0 (0.0-8.5)
Age at onset bands, No. (%)	
<30 years	200 (54.8)
30-50 years	147 (40.3)
>50 years	18 (4.9)
Regions involved at onset, No. (%)	
Isolated optic nerve	55 (15.1)
Isolated brainstem/cerebellum	68 (18.6)
Isolated spinal cord	53 (14.5)
Isolated cerebrum	83 (22.7)
Poly-system onset	106 (29.0)
Recovery from the first attack, No. (%)	
Complete recovery	198 (54.2)
Partial recovery	148 (40.5)
Failed to recover	19 (5.2)
Relapses in the first 2 years after disease onset, No. (%)	
0-1 relapse	301 (82.5)
≥2 relapses	64 (17.5)
Exposure to DMTs, No. (%)	106 (29.0%)
Duration of DMTs, median (IQR), years	1.99 (1.00, 2.64)
Clinical phenotype at last follow up, No. (%)	
RRMS	331 (90.7)
SPMS	34 (9.3)
EDSS score at last follow-up, No. (%)	
EDSS<6.0	316 (86.6)
EDSS≥6.0	49 (13.4)
Kaplan-Meier estimates of time from MS onset to:	
EDSS=6.0, years	22.0 (95% CI16.5,27.5)

EDSS: Expanded Disability Status Scale; IQR: interquartile range; MS: multiple sclerosis;

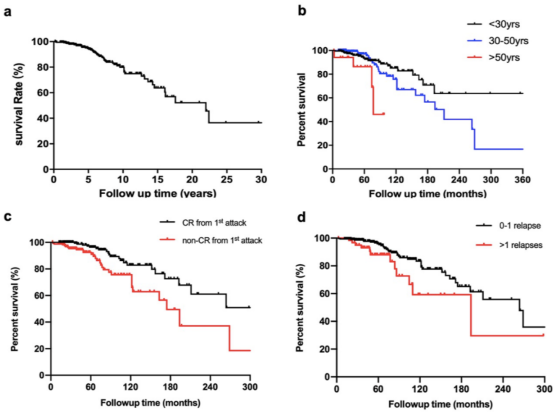

Fig 2. Kaplan-Meier curves showing the time and prognostic factors of attaining an EDSS of 6.0

Conclusion

Our results confirm the importance of age at onset, recovery from the first attack, and number of relapses during the first 2 years after disease onset as predictors of disability progression in Chinese patients with relapsing-onset MS.