

The Multiple Sclerosis Severity Score (MSSS) re-examined: EDSS rank stability in the MSBase dataset increases 5 years after onset of multiple sclerosis

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Background: The Global Multiple Sclerosis Severity Score (MSSS)¹ was devised as a comparative multiple sclerosis (MS) population disability assessment tool, to allow comparisons of relative disease severity at all EDSS levels for a given disease duration, using a single clinical assessment at a single point in time. It has been validated for use comparing disease progression in groups of patients but not in the clinical setting on an individual basis.

Objective: To assess the stability of MSSS scores in the MSBase dataset², a large multi-centre cohort study.

Methods: Data was extracted on 4th of April 2008 from all centres with more than fifty cases. All cases satisfied the Poser criteria for definite MS or the McDonald criteria for MS. The duration of disease was categorized into 4 time periods: "0 year duration" being the 0-2.5 year interval, "5 year duration" being the 2.5-7.5 year interval, "10 year duration" being the 7.5-12.5 year interval and "15 year duration" being the 12.5-15 year interval. Cases with EDSS scores spanning the intervals 0-5 years, 5-10 years and 10-15 years from disease onset were analysed. Cases were ranked within each interval and MSSS stability was assessed using Spearman rank-sum correlations and as the proportion of patients remaining within 15% of their original rank.

Results: The dataset comprised 6100 cases and 38,683 complete EDSS scores from 25 clinical centres in 20 countries. Mean EDSS scores were 2.02 at 0 years, 2.67 at 5 years, 3.15 at 10 years and 3.49 at 15 years. Table 1 records number of cases, mean change in EDSS and Spearman rank-sum correlation between MSSS over the three time intervals. 58.3% of patients remained within 15% of their original MSSS in the 0-5 year interval, increasing to 68.8% in the 5-10 year interval and to 76.5% in the 10-15 year interval. Figure 1 demonstrates the change in rank of EDSS scores at 0 and 5 years, 5 and 10 years and 10 and 15 years.

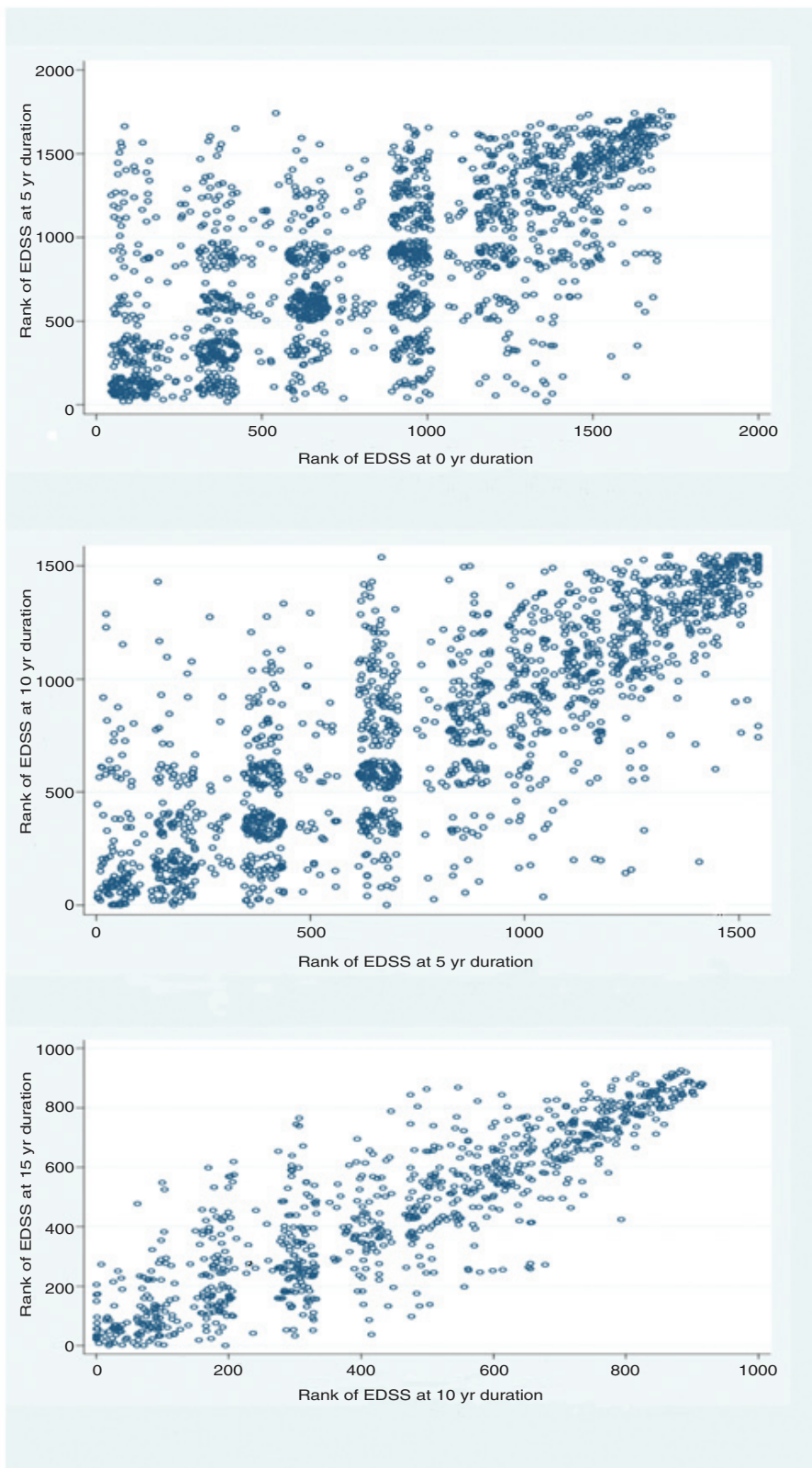


Figure 1. Scatter plots of ranks of EDSS scores at (a) 0 and 5 years (1692 cases), (b) 5 and 10 years (1546 cases) and (c) 10 and 15 years (893 cases).

Table 1: Number of cases, mean change in EDSS, Spearman rank-sum correlation for the time intervals 0-5 years, 5-10 years and 10-15 years from disease onset

| Interval (years) | No. of cases | Mean change in EDSS | Spearman rank sum correlation |
|------------------|--------------|---------------------|-------------------------------|
| 0 - 5 | 1692 | +0.26 | 0.66 |
| 5 - 10 | 1546 | +0.45 | 0.80 |
| 10 - 15 | 893 | +0.34 | 0.88 |

Conclusions: We have demonstrated an increasing rank correlation between median EDSS scores at 0 and 5 years ($r=0.66$), 5 and 10 years ($r=0.80$) and 10 and 15 years ($r=0.88$). We suggest that increasing rank stability is most likely due to less relapse and non-relapse related fluctuations of neurological signs detected in clinical examination with increasing disease duration. This study confirms the validity of the MSSS as a 5-year severity rank predictor in individual patients with MS in a clinical setting, particularly from 5 year disease duration onwards. Individual prognostic value is likely to be highest for individuals whose EDSS scores are less than 1.5 or greater than 2.5 at the time of assessment.

References

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2. Butzkueven H, Chapman J, Cristiano E, *et al.* MSBase: an international, online registry and platform for collaborative outcomes research in multiple sclerosis. *Multiple Sclerosis* 2006; 12:769-74.