



# Comorbidity evaluation in Multiple Sclerosis patients: effect on clinical outcomes

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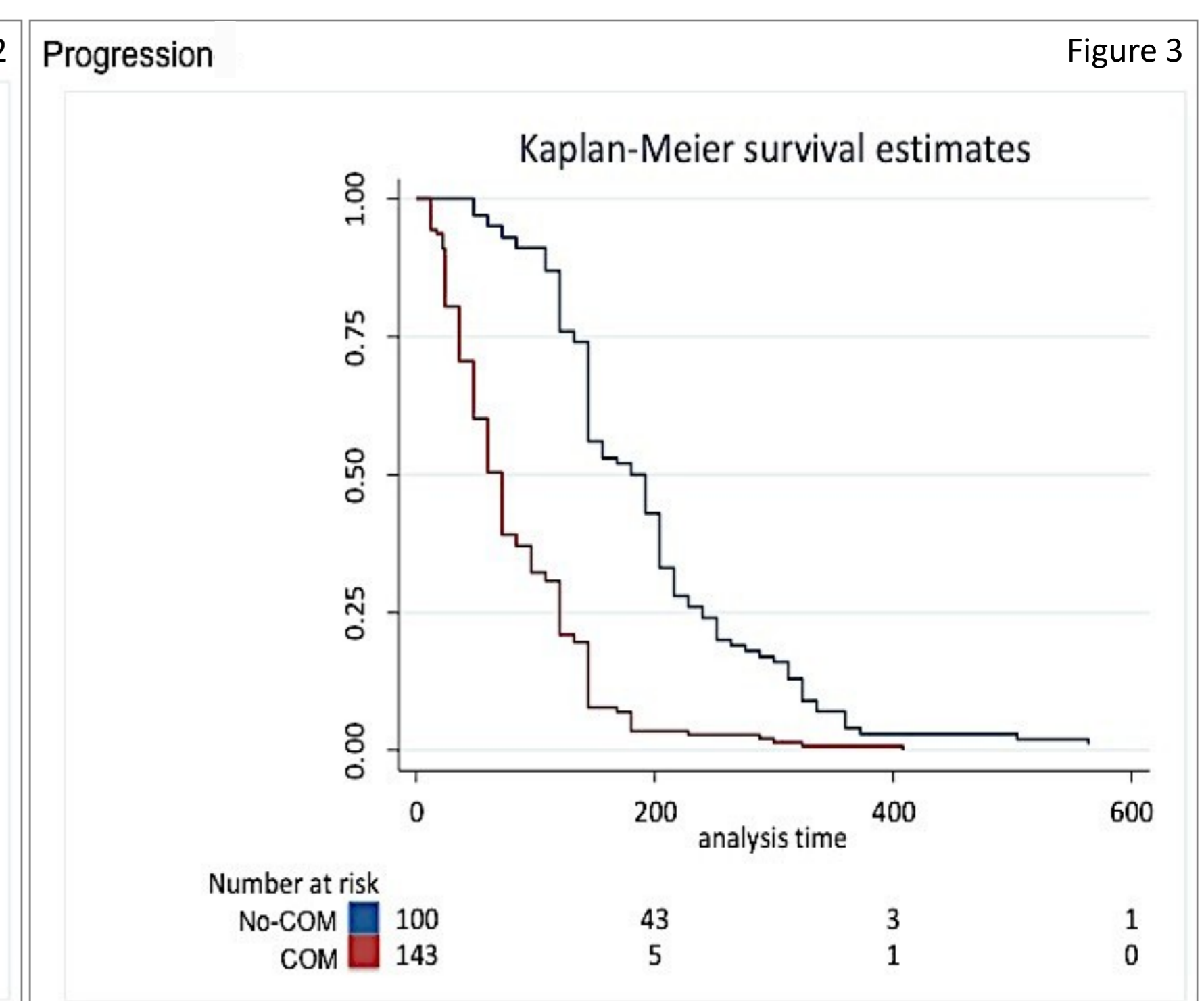
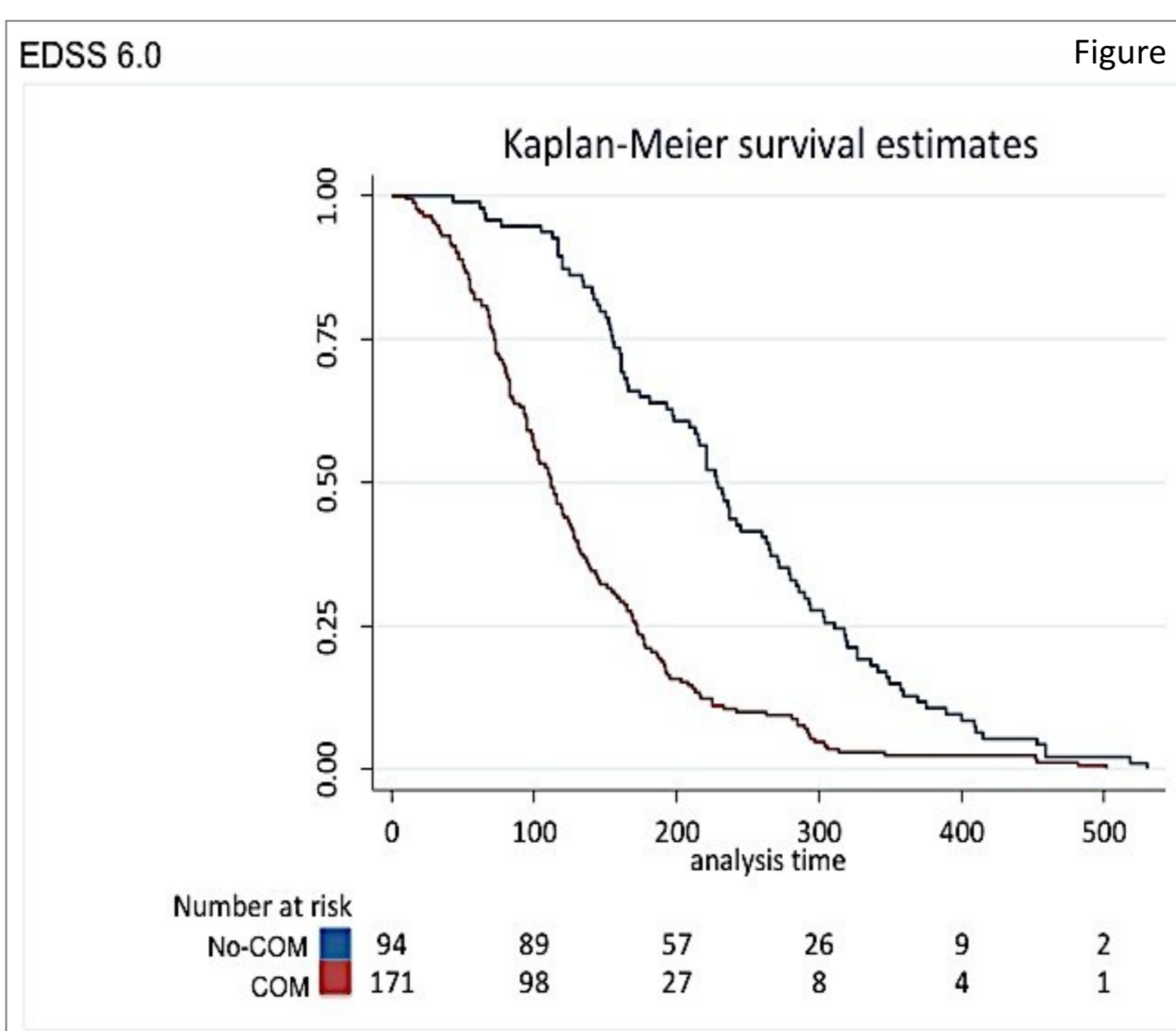
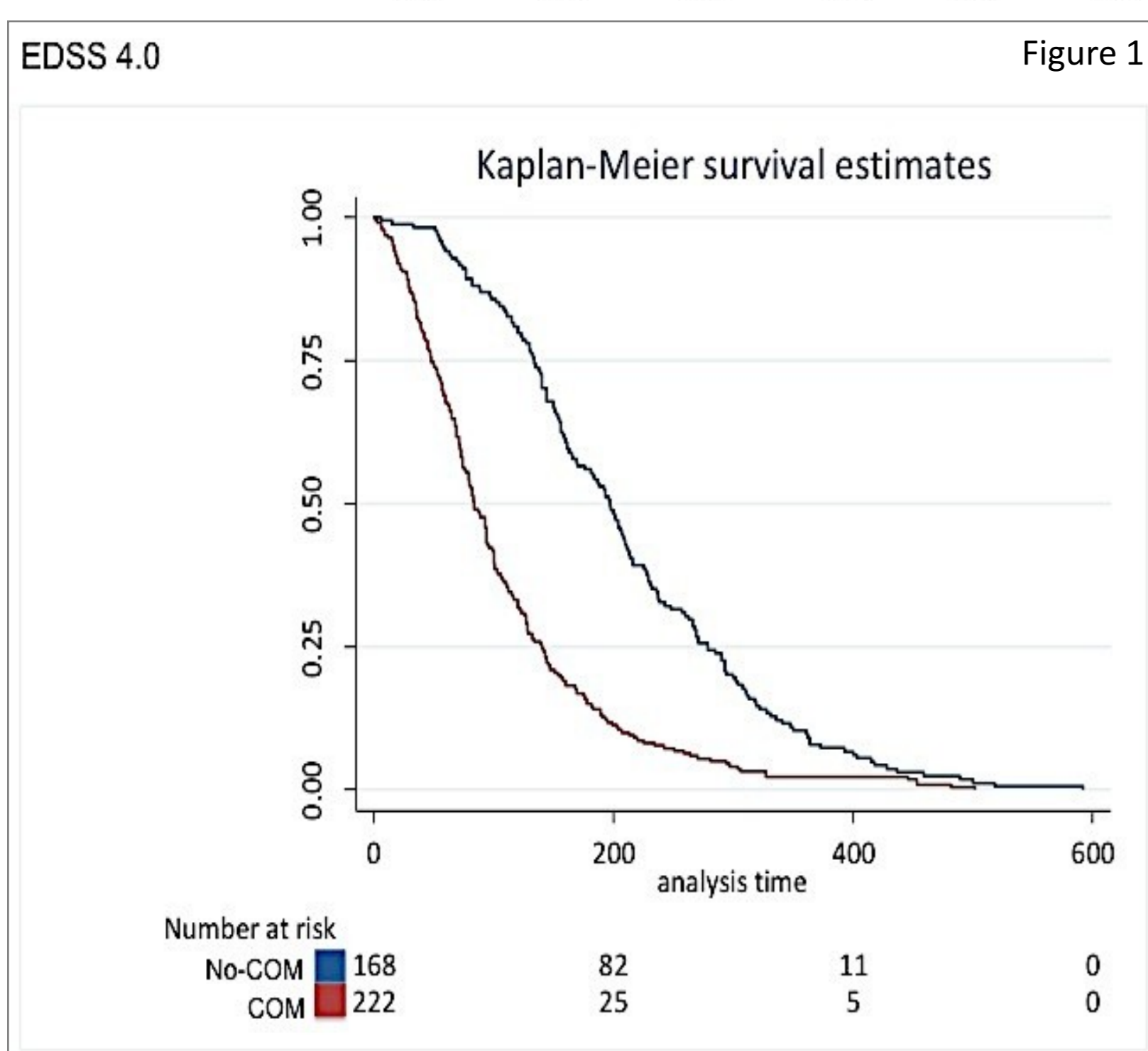
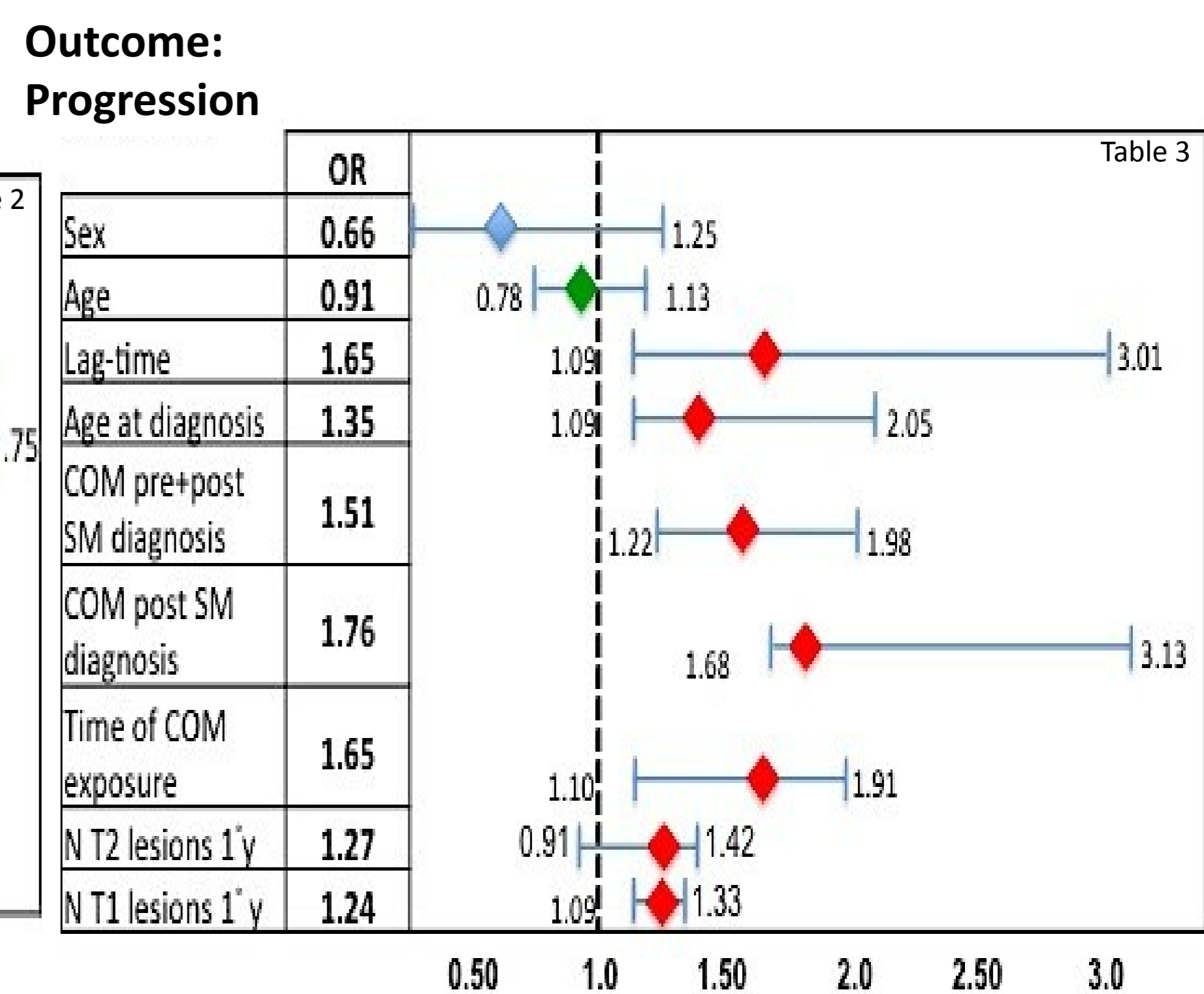
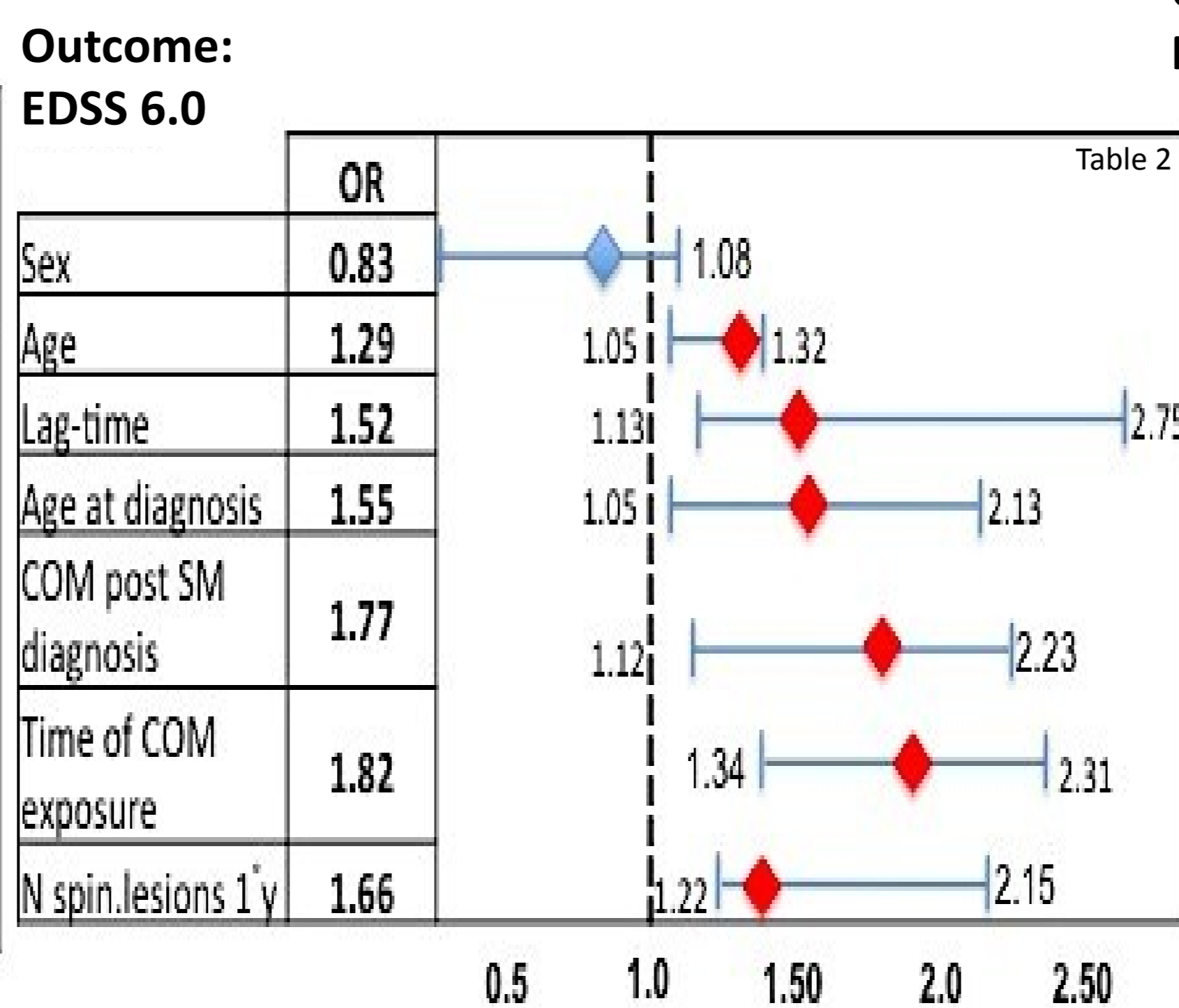
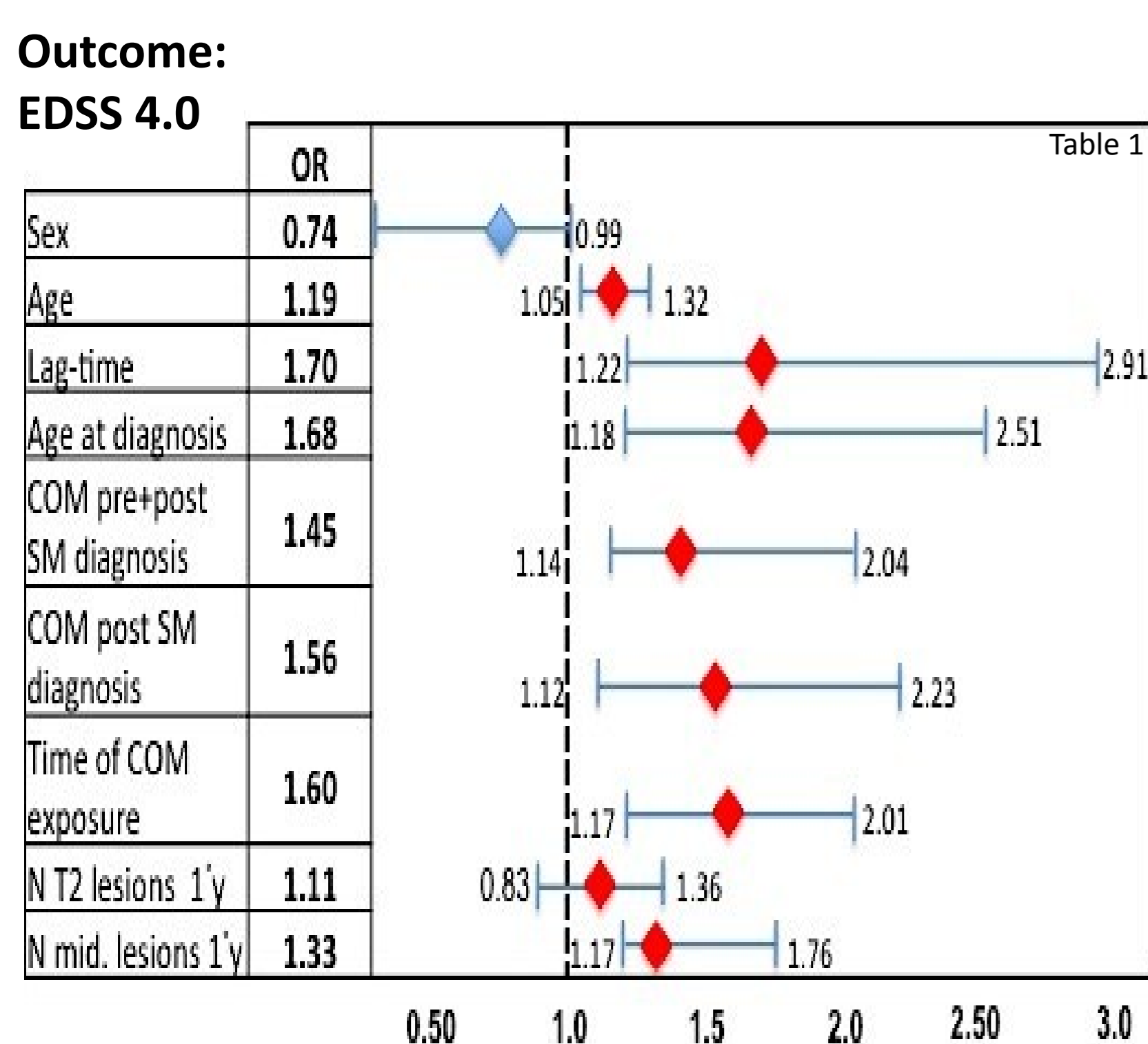
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**Introduction:** Despite growing understanding of the effects of comorbidity in Multiple Sclerosis (MS), important gaps persist about how identifying these conditions in clinical practice, and how they may influence clinical course and treatment decision making. Aims of our study were to evaluate the frequency of comorbidity in a large cohort of MS patients and the effects of comorbidities on clinical outcomes.

**Materials and methods:** This observational retrospective study screened 2030 patients referring to the MS Center of Catania in the period between 1st January 2005 and 31st December 2015 with diagnosis of MS according to MC Donald criteria, and who underwent at least 4 neurological visits. The protocol study was approved by the local Ethical committee and all patients gave their informed consent to the study. All patients underwent a complete neurological examination with Expanded Disability Status Scale (EDSS) score. According to the comorbidity presence, patients were divided in two groups: COM presenting at least one comorbidity and no-COM experiencing no comorbidities. Based on the occurrence time of the comorbidities with respect to MS diagnosis, the COM group was divided in COM pre and COM post MS diagnosis. Number and characteristics of comorbidities and exposure time to the comorbidities were also evaluated.

**Results:** Out of 2030, 1043 MS patients (65.3% women, mean age  $48.04 \pm 13.0$ ) satisfied the inclusion criteria and were finally enrolled. We found 641 (61.5%) in the COM group, 402 (35.8%) in the no-COM group. COM patients were older than no-COM ( $51.4 \pm 12.3$  vs  $42.8 \pm 12.2$  years,  $p < 0.05$ ), with higher age at onset ( $33.1 \pm 10.7$  vs  $26.9 \pm 9.0$  years,  $p < 0.05$ ) and longer lag-time ( $62.5 \pm 18.4$  vs  $43.9 \pm 6.7$  months,  $p < 0.05$ ). COM group showed worse mean EDSS ( $3.2 \pm 3.0$  vs  $2.0 \pm 1.9$ ,  $p < 0.05$ ) and a shorter time-to-reach EDSS 4.0 ( $154.3 \pm 109.8$  vs  $160.9 \pm 105.6$  months,  $p < 0.05$ ), EDSS 6.0 ( $88.1 \pm 111.4$  vs  $123.7 \pm 121.1$  months,  $p < 0.01$ ) and secondary progressive course ( $97.4 \pm 75.0$  vs  $136.6 \pm 97.6$  months,  $p < 0.01$ ). Cox-regression analysis showed that lag-time, age at onset, exposure time to the comorbidity and comorbidities occurring post MS diagnosis, were associated with worse clinical outcomes (EDSS 4.0, EDSS 6.0 and entering in progressive form) (Tables 1-3). Female gender was found to be a protective factor for the clinical outcomes.



**Conclusion:** Our data confirmed that comorbidities are associated with greater disability progression. We also found that comorbidities occurring post MS diagnosis were associated with a high risk of disability and MS progression. To handle and treat MS comorbidities should be carefully considered in MS managing and treatment decision.

**Bibliography:** Marrie RA, et al. *Association between Comorbidity and Clinical Characteristics of MS*. Acta Neurol Scand. 2011 Aug;124(2):135-41.  
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Marrie RA, et al., *A systematic review of the incidence and prevalence of comorbidity in multiple sclerosis: overview*. Mult Scler. 2015 Mar;21(3):263-81.

