Brain volume loss correlates with long-term disability worsening in patients with ms: siena analysis of temso mri data

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Introduction: In TEMSO (NCT00134563), SIENA (structural image evaluation using normalization of atrophy) analysis determined that, vs placebo, teriflunomide significantly reduced brain volume loss (BVL), which was strongly correlated with disability worsening. Subgroup analyses showed that teriflunomide significantly slowed BVL vs placebo independently of disability worsening over 2 years. Here, we explore BVL and long-term disability worsening in TEMSO and its extension (NCT00803049). Methods: Blinded SIENA analysis of patient scans (n=969) determined BVL in Year 1 and Year 2. Percentage brain volume changes (PBVC) from baseline to Year 2 were categorized into quartiles (Q1–Q4) to evaluate probability of 12- and 24-week confirmed disability worsening (CDW) over 5 years in the extension. Probability of worsening was derived from Kaplan–Meier estimates. Quartiles were compared using a Cox proportional hazards model (covariates: PBVC categories, baseline Expanded Disability Status Scale strata, and region). Results: Patients with scans in Q1 (n=177; greatest BVL from baseline to Year 2) had a significantly higher risk of 12- and 24-week CDW after 5 years than those in Q4 (n=178; lowest BVL from baseline to Year 2): Q1 vs Q4 hazard ratios, 0.611 (95% CI: 0.432, 0.865; P=0.0055) and 0.566 (95% CI: 0.386, 0.830; P=0.0036) for 12- and 24-week CDW after 5 years, respectively. Conclusions: Results provide further evidence of the association between BVL and later disability worsening. Greater rates of BVL over 2 years are predictive of longer-term disability worsening at 5 years in the TEMSO extension. Study supported by Sanofi Genzyme. Previously presented at ECTRIMS 2016.