Comparative analysis of dimethyl fumarate and teriflunomide in relapsing remitting multiple sclerosis

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Introduction: Dimethyl fumarate (DMF) and teriflunomide (TFL) are two oral drugs that reduce the relapse activity in patients with relapsing-remitting multiple sclerosis (RRMS). A direct comparison with a head-to-head randomized controlled trial (RCT) has not been performed, yet. Analyses from observational studies comparing the effectiveness of DMF and TFL showed conflicting results.

Objective: To compare the treatment effectiveness of DMF and TFL in a real-world setting, where both drugs are licensed as a first-line disease modifying therapy for RRMS.

Methods: We included all patients who initiated disease modifying therapy (DMT) with either DMF or TFL between February 1995 and March 2019 in the Swiss national treatment registry governed by the Swiss Federation for Common Tasks of Health Insurances (SVK). Coarsened exact matching and inverse probability of treatment weighting were applied at timepoint of DMT initiation using age, gender, disease duration, baseline Expanded Disability Status Scale (EDSS) score, time since last relapse and relapse rate in the previous year as covariates. Time to relapse and time to EDSS progression were analyzed using a pairwise censored Cox-proportional hazard model. Exploratory analysis included the evaluation of patients who switched from DMF to TLF, and vice versa.

Results: In total, 1625 RRMS patients were included (DMF, n=1214; TFL, n=411), of which 620 patients were matched (DMF, n=310, 72.3% females, age in years mean±SD 44.3±10.4, disease duration in years mean±SD 8.5±7.7, EDSS median 2.0; TFL, n=310, 73,2% females, age mean±SD 44.1±10.5, disease duration mean±SD 8.5±7.7, EDSS median 2.0). When analyzing unmatched groups, there was no difference between DMF and TFL with regards to time to relapse. However, time to relapse was significantly longer in the DMF compared to the TFL-group in the matched analysis (matched: HR 0.72, 95%CI 0.54-0.97, p=0.03; weighted: HR 0.75, 95%CI 0.58-0.98, p=0.02). For disability progression, we found a longer time to EDSS progression in the DMF- compared to the TLF-group (unmatched: HR 0.58, 95%CI 0.39-0.84, p<0.01, with similar results in matched and weighted analysis). Patients switching from DMF to TFL (n=57) had lower relapse rates in the year before (8.8%) than patients switching from TFL to DMF (n=62, 39.3%).

Conclusion: Analysis of real-world data indicated that in RRMS, DMF might be more effective in reducing relapse rate compared with TFL.