INTRODUCTION

Teriflunomide and dimethyl fumarate (DMF) have both demonstrated efficacy as oral therapies in a number of clinical trials in patients with relapsing-remitting MS. Despite the well-known challenges in comparing outcomes across studies, one common approach is to use the number needed to treat (NNT) to facilitate a better understanding of the clinical significance of treatment effects.

However, these comparisons do not take into account differences in patient populations in clinical studies, which may affect the interpretation from inter-study comparisons. Relative risk reductions may also over-estimate treatment effects when the frequency of the event is low.

Evidence-based medicine often utilizes approaches such as the absolute risk reduction and number needed to treat (NNT) to facilitate a better understanding of the clinical significance of treatment effects.

METHODS

Study Designs

All 4 studies were phase 3, randomized, placebo-controlled, multinational trials evaluating teriflunomide (14 or 14 mg/day; or placebo) or DMF (240 mg twice- or three-times daily vs placebo) in patients with relapsing-remitting MS (DEFINE, DEFFIE, CONFIRM, CONFIRM2) in patients with relapsing MS. The primary endpoint was annualized relapse rate (ARR, in TEMSO, TOWER, CONFIRM) or the proportion of patients who had relapsed by 2 years (in DEFINE) (Table 1).

Calculation of NNT

In a post hoc analysis, the NNT to prevent 1 relapse, or 1 relapse leading to hospitalization, was calculated from the inverse of the risk difference (absolute risk) of ARR in the placebo group (ARRp) and the active treatment group (ARRa):

\[ \text{NNT} = \frac{1}{\text{ARRa} - \text{ARRp}} \]

The NNT to prevent 1 patient experiencing disability progression was calculated using the Altman derivation, taking into account the survival probabilities in the placebo and active treatment groups:

\[ \text{NNT} = \frac{1}{\text{ARRa} - \text{ARRp}} \]

RESULTS

Table 2. Demographic and Baseline Disease Characteristics in Teriflunomide and DMF Studies

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Teriflunomide</th>
<th>DMF</th>
</tr>
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<tbody>
<tr>
<td>Mean (SD) age (years)</td>
<td>37.7 (6.8)</td>
<td>37.9 (6.5)</td>
</tr>
<tr>
<td>Median age (SD)</td>
<td>36 (18.5)</td>
<td>38 (17.8)</td>
</tr>
<tr>
<td>Female, %</td>
<td>72.2</td>
<td>71.1</td>
</tr>
<tr>
<td>Median relapse-free interval,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>years</td>
<td>18.0 (10.3)</td>
<td>18.9 (11.0)</td>
</tr>
<tr>
<td>Time from first symptoms of MS,</td>
<td>5.5 (5.46)</td>
<td>5.5 (4.49)</td>
</tr>
<tr>
<td>years</td>
<td>5.5 (4.49)</td>
<td>5.5 (4.49)</td>
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<td>5.0 (5.46)</td>
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<td>5.0 (4.49)</td>
<td>5.0 (4.49)</td>
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NNT to Prevent 1 Relapse

Teriflunomide and DMF significantly reduced risk of relapse or relapse in all studies; a higher relative risk reduction was observed for DMF, but similar absolute differences/NNTs to placebo in all studies; a higher relative risk reduction was demonstrated efficacy as oral therapies in a number of clinical trials.

NNT to Prevent 1 Relapse Leading to Hospitalization

Risk of relapse leading to hospitalization was significantly reduced for both relapse and relapse-related hospitalization in both teriflunomide studies, but not in the DMF studies.

CONCLUSIONS

NNT is an approach that can help compare results across clinical trials. Using the NNT approach, we demonstrated that teriflunomide is significantly more effective than placebo for DMF; similar absolute differences/NNTs for number needed to treat providing more detailed information.

REFERENCES


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Disclosures

The authors have none to declare.

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