Patient Preferences in the Choice of Disease-Modifying Drugs for Multiple Sclerosis

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INTRODUCTION

Multiple sclerosis (MS) is a chronic inflammatory autoimmune disease associated with neurodegenerative processes in the central nervous system.1 In young adults, it is the most common chronic neurologic disease, often leading to permanent disability.2 Relapsing-remitting MS (RRMS) is the most common form of MS. There are a variety of treatment options available for RRMS associated with different characteristics in key attributes, including neurologic disease, often leading to permanent disability.

METHODS

Study design

Using a questionnaire-based discrete choice experiment (DCE), patients with MS were asked to choose the most and least preferred treatment type (best-worst scaling) among hypothetical multivariate alternatives. These were based on typical characteristics of first-line disease-modifying drugs (DMDs).

- Multivariate alternatives included varying levels of the following key attributes of typical first-line DMDs:
  - Route of administration, frequency of administration, required monitoring of the patient, local and systemic side effects.
  - Previous studies have established efficacy as being of primary importance to patients with MS. Thus, this attribute was not included in the present design as it would have reduced the likelihood of significant trade-offs between other DMD attributes and route of administration.
  - The specific characteristics of exacerbation treatments for MS were not considered in this evaluation.
  - Choices were repeated in a fractional factorial design consisting of orthogonally composed alternatives (ie, multiple scenarios were included in the present design as it would have reduced the impact on patients with MS).
  - The majority (53.4%) of patients were currently receiving DMDs approved for therapy in the European Union (EU; mainly interferon beta and glatiramer acetate; Figure 2).
  - 24% of patients were receiving DMDs indicated for exacerbation therapy in the EU at the time of the study (mainly fingolimod and natalizumab; Figure 2).
  - 17.2% of patients were not receiving DMDs during this study, of which 3.6% (n=190) were treatment naive.
  - 87.8% of patients reported current or prior experience with injectable DMDs.
  - Patients not currently receiving treatment reported more recent relapses (Table 1; chi-square test, P=0.001) and their health status was significantly lower than patients on DMDs, as measured with EQ-5D (mean, 0.81 vs 0.86; ANOVA, P=0.001).
  - The impact of each attribute and level on the choices made by participants was estimated by means of statistical analyses, allowing inferences on patients’ latent preference structure.
  - The specific design (Case 3, multiprofile case) simulates a real choice situation between hypothetical multivariate treatment alternatives (Figure 1).

Study population

1628 patients with RRMS were recruited from 38 neurological practices in Germany, irrespective of their current treatment status (ie, basic, escalated, or no DMD).

- Age, age at diagnosis, sex, date of last relapse, current and previous treatment with DMDs, and self-reported health status (measured by the EuroQol 5-Dimension instrument [EQ-5D]).

RESULTS

Study population

- On average, patients were aged 42.4 years with 9.9 years of disease duration at the time they answered the questionnaire.
- 74.6% of the patients were females who were significantly younger at diagnosis than males (mean, 32.2 vs 33.5 years, respectively; ANOVA, P=0.003).
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Figure 1: Example of a DCE scenario as used in the questionnaire

- Continuous population variables (eg, age) were tested with analysis of variance (ANOVA) and correlation analysis; bivariate variables were assessed (eg, sex) with chi-square tests.
- Each questionnaire included 8 orthogonally varied choice situations.

TABLE 1: Disease activity by treatment status (N=1522)

<table>
<thead>
<tr>
<th>Treatment status</th>
<th>Never treated</th>
<th>Escalation</th>
<th>Within last 6 months</th>
<th>Within last 12–24 months</th>
<th>&gt;24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>No DMD (%)</td>
<td>51</td>
<td>138</td>
<td>83</td>
<td>90</td>
<td>36</td>
</tr>
<tr>
<td>DMD (%)</td>
<td>49</td>
<td>687</td>
<td>62</td>
<td>56</td>
<td>64</td>
</tr>
</tbody>
</table>

Figure 2: Current DMD status

- The regression analysis predicts the counts of levels simultaneously chosen as best and worst across DCE scenarios to estimate the levels’ influences on patients’ choices. β-weights from the regression equation are interpreted as levels’ part-worth utilities. Unlike count analysis, regression analysis allows inferences on the statistical significance of the levels influences.
- Negative β-weights indicate a level predominantly picked as worst, thus considered unfavorable (negative utility); positive β-weights indicate a level predominantly picked as best, thus considered favorable (positive utility).

Figure 3: DCE results count analysis

- Notably, the studied systemic side effects, such as flu-like symptoms or gastrointestinal disturbances, were only as half as important as mode of administration for patients’ choices based on the attribute impact in count analysis.

DISCUSSIONS

- In a representative RRMS sample in which a majority of patients had prior experience with injectable DMDs, count and regression analyses yielded that, among attributes included in the study, route of administration was most important in guiding patients’ preferences, with oral administration being most desirable (selected as best in 63% of cases).
- The second most important attribute in guiding patients’ preferences was frequency of administration, with administration once a week being the preferred attribute level (41% of cases).
- The present study aimed to determine the relative importance of key DMD characteristics for preferences of patients with MS, especially regarding indications for and management of adverse effects. Since the new oral route of administration differs from established injectables, the relative importance of attributes of DMDs might change from the perspective of the patient. To encourage significant trade-offs for a significant importance and route of administration, efficacy was not included across scenarios in the DCE.
- Notably, the studied systemic side effects, such as flu-like symptoms or gastrointestinal disturbances, were only as half as important as mode of administration for patients’ choices based on the attribute impact in count analysis.

REFERENCES

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