Switching to Fingolimod or Interferon Beta-1a: A Cost-Effectiveness Analysis

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CONCLUSIONS

- Patients with MS who have recently failed self-injectable DMT therapy may obtain clinical and economic benefits by switching to fingolimod as opposed to switching to IM IFNβ-1a therapy.
- Previous studies have shown switching to a different type/class of DMT may be better for patients in terms of ARR; this model showed additional economic benefits of switching to another class with higher efficacy in patients with prior treatment failure with any IFNβ or glatiramer acetate.
- Furthermore, in patients with prior treatment failure with any IFNβ or glatiramer acetate, the model forecasted positive results if the switch was made to another class of DMT, and in this case, fingolimod.
- Switching to a higher efficacy DMT is more cost-effective compared to switching between self-injectable DMTs.

INTRODUCTION AND BACKGROUND

- Self-injectable disease modifying therapies (DMTs) are the most common treatments for relapsing-remitting multiple sclerosis (RRMS), reducing the frequency and severity of exacerbations and delaying disease progression.[1-7]
  - However, a proportion of patients continue to experience treatment failure.
    - In a study of 252 patients treated with subcutaneous (SC) interferon (IFN) beta (β)-1b, intramuscular (IM) IFNβ-1a, or SC IFNβ-1a, treatment failure (using a variety of criteria to define failure) was seen in as many as 29% of patients at Year 2.[8]
  - For those patients who experience a suboptimal response on IFNβ, switching to another DMT class has been shown to yield significant reductions in annualized relapse rate (ARR) compared with trying a different IFNβ.[9]
- Fingolimod, a sphingosine-1 phosphate receptor modulator, is an oral agent that has shown higher efficacy in reducing relapse rates compared to placebo and an active comparator.[10,11]
- In a 1-year, head-to-head, double-blind, double-dummy, Phase 3 study (TRANSFORMS), oral fingolimod 0.5 mg was shown to significantly reduce relapse frequency compared with IM IFNβ-1a.[11]

OBJECTIVE

- To examine the cost-effectiveness of switching patients with RRMS who experienced treatment failure with any IFNβ or glatiramer acetate to fingolimod versus switching to IM IFNβ-1a.

METHODS

- A Microsoft® Excel-based model was used to calculate the cost per relapse avoided over a 1-year time period after switching to fingolimod or switching to IM IFNβ-1a from any IFNβ agent (IM or SC IFNβ -1a, SC IFNβ-1b) or glatiramer acetate.
- ARR of previously-treated patients who switched to fingolimod or IM IFNβ-1a were included from previously published post-hoc analyses of TRANSFORMS.[11]
- One-way sensitivity analyses were performed on key input variables.

RESULTS

- **Table 1** presents the input variables for both groups.
- The ARR of patients switching to fingolimod was 0.26 versus 0.53 for patients switching to IM IFNβ-1a after assumed treatment failure.
  - Annual relapses before treatment equaled 0.77.[12]

Table 1. Input Variables

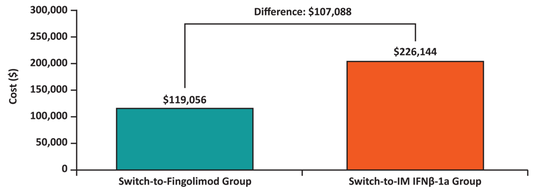
	Group	
	Switch to Fingolimod (n=246)[a]	Switch to IM IFNβ-1a (n=248)[a]
Treatment costs		
Unit costs (WAC), $[b]	$158	$979
Yearly administration	365	52
Yearly costs, $	$57,546	$50,882
Monitoring costs (1 y), $[c]	$1,849	$695
Average direct cost to manage relapse, $	$5,091	$5,091
ARR	0.26	0.53
Annual relapses before treatment	0.77[12]	
Relapse avoided	0.51	0.24
Annual cost of relapse	$1,324	$2,698
Overall therapy-associated costs		
Monitoring costs	$1,849	$695
Pharmacy costs	$57,546	$50,882
Relapse costs	$1,324	$2,698
Total annual costs of therapy	**$60,719**	**$54,275**

IM=intramuscular; IFN=interferon; β=beta; WAC=wholesale acquisition costs; $=dollars; y=year; ARR=annualized relapse rate.
[a]Data were taken from Khatri BO, et al. Effect of fingolimod on relapse rate by prior treatment status and reason for discontinuation: TRANSFORMS subgroup analyses [poster]. Presented at: American Neurological Association (AAN) 136th Annual Meeting, San Diego, CA, September 25-27, 2011; Poster #T1708. [b]WAC as of December 2012. [c]Based on monitoring requirements in each agent's respective prescribing information.

RESULTS (CONT'D)

- The cost per relapse avoided was $119,056 in the switch-to-fingolimod group as compared with $226,144 in the switch-to-IM IFNβ-1a group (**Figure 1**).
  - Incremental cost-effectiveness ratio (ICER)=$23,866 per relapse avoided with fingolimod.

Figure 1. Cost Per Relapse Avoided



$=US dollars; IM=intramuscular; IFN=interferon; β=beta .

- One-way sensitivity analyses for fingolimod-associated parameters showed that the cost per relapse avoided results were most affected by ARR of untreated patients and relapse reduction from fingolimod (**Figure 2a**).

RESULTS (CONT'D)

- IM IFNβ-1a cost per relapse avoided was most influenced by its ARR and that of untreated patients, as shown by univariate sensitivity analyses (**Figure 2b**).
- Cost per relapse avoided was less sensitive to annual cost of a relapse and monitoring costs for both medications.

LIMITATIONS

- Modeling requires assumptions about the disease, treatment patterns, and costs that may not be relevant to all clinical situations.
- Because serious adverse events with these agents are rare, the costs associated with adverse events were not included.
- The impact of disability progression, which has long-term implications, was not included in the model which focused on a 1-year time horizon.
- Adherence to both fingolimod and IM IFNβ-1a was assumed to be 100%, but adherence in clinical settings may be different due to the differences in administration routes.
- The model assumed that all patients switched agents due to unsatisfactory treatment efficacy (UTE), which might not have been the case, although an internal subgroup analysis of switched patients due to UTE showed similar results.

Figure 2a. Sensitivity Analysis of Cost per Relapse Avoided for Fingolimod

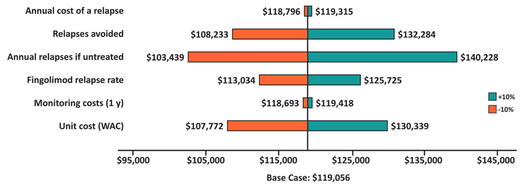
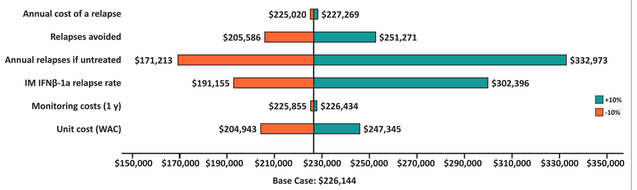


Figure 2b. Sensitivity Analysis of Cost per Relapse Avoided for IM IFNβ-1a



y=year; WAC=wholesale acquisition costs; IM=intramuscular; IFN=interferon; β=beta.

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Disclosures

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