Cost per Responder Analysis of Guselkumab Versus Certolizumab Pegol Using Efficacy Results from Pivotal Clinical Trials in Patients with Moderate to Severe Plaque Psoriasis

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Background
Biologic therapies are commonly used in the United States (US) to treat moderate to severe plaque psoriasis, a chronic, pruritic, inflammatory-immune-mediated skin disease that has been shown to have a negative impact on patients’ productivity and quality of life and to incur substantial medical care costs (Kardasis-Dagli et al., 2015; Beesley et al., 2015; Acutis et al., 2015).

Guselkumab is an anti-interleukin-23 monoclonal antibody administered by subcutaneous injection that is indicated for the treatment of moderate to severe plaque psoriasis.

Certolizumab pegol is a monoclonal antibody to TNF-α administered by subcutaneous injection that is indicated for the treatment of moderate to severe plaque psoriasis.

Methods
The calculation used to estimate the cost per responder was the following:

\[ \text{Cost per Responder} = \frac{\text{Dosing and Pricing Inputs} + \text{Induction Year Costs}}{\text{PASI 75 and PASI 90 Response Rates}} \]

The calculation used to estimate the cost per responder is shown in Table 1.

Table 1. Dosing and Pricing Inputs for Guselkumab and Certolizumab Pegol

<table>
<thead>
<tr>
<th>Input Description</th>
<th>Guselkumab</th>
<th>Certolizumab Pegol</th>
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<tbody>
<tr>
<td><strong>Dosing</strong></td>
<td>100 mg SC at Week 0, 4, and every 8 weeks</td>
<td>400 mg SC every 2 weeks</td>
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<tr>
<td><strong>Induction Year Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 16 Total</strong></td>
<td>$100,000.00</td>
<td>$214,159.51</td>
</tr>
<tr>
<td><strong>PASI 75</strong></td>
<td>81.2%</td>
<td>73.2%</td>
</tr>
<tr>
<td><strong>PASI 90</strong></td>
<td>51.7%</td>
<td>49.1%</td>
</tr>
<tr>
<td><strong>52 Weeks Induction Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 52 Total</strong></td>
<td>$100,000.00</td>
<td>$214,159.51</td>
</tr>
<tr>
<td><strong>PASI 75</strong></td>
<td>91.2%</td>
<td>87.8%</td>
</tr>
<tr>
<td><strong>PASI 90</strong></td>
<td>58.1%</td>
<td>73.2%</td>
</tr>
</tbody>
</table>

Efficacy data through week 16 from clinical trials for both products are available (VINDYGE 1 and VINDYGE 2 for guselkumab; Blauvelt et al., 2017; 2017) and CIMPACT for certolizumab pegol (Lebwohl et al., 2018). Understanding the relative value of new treatments for moderate to severe plaque psoriasis is important for insurers, health care providers, patients, and government health authorities.

Objective
To estimate the cost per responder in the US for guselkumab relative to certolizumab pegol in the first year induction period of treatment based on indirect comparison of efficacy results from pivotal clinical trials (VINDYGE 1 for guselkumab and CIMPACT for certolizumab pegol).

Results
The calculation used to estimate the cost per responder is shown in Table 1.

The first-year WAC costs (induction) were $81,268.58 (81.2% for guselkumab) and $130,381.74 (51.7% for certolizumab pegol). Figure 1 shows the percentage of patients in the VINDYGE 1 and CIMPACT trials reaching a PASI 75 response at 16 weeks (73.2% for guselkumab and 49.1% for certolizumab pegol), and the percentage of patients reaching a PASI 75 response at 52 weeks (51.7% for guselkumab and 49.1% for certolizumab pegol).

Figure 2 shows the percentage of patients reaching a PASI 75 or PASI 90 response at 16 weeks. This analysis was supported by Janssen Scientific Affairs, LLC.

Conclusions
This analysis based on indirect comparison of efficacy data from the VINDYGE 1 and CIMPACT trials, demonstrated that guselkumab is a more cost-effective therapy than certolizumab pegol, with a lower cost per responder for achieving PASI 75 and PASI 90 responses in the first year of treatment among patients with moderate to severe plaque psoriasis.

Limitations
- Perfect adherence was assumed for purposes of costing.
- A formal indirect comparison was not conducted, however, enrolled population characteristics were similar.
- Response rates were not adjusted for plausible placebo response (i.e., placebo response rates were similar in both trials).
- Efficacy results in the base case were assumed to be unchanged from week 16 to week 52.
- A cost per responder analysis based on PASI 20 outcomes was not included as PASI 20 results were not available in the published CIMPACT trial results.
- All Certolizumab Pegol week 16 PASI 75 and PASI 90 response rates from CIMPACT were used.

(This analysis was supported by Janssen Scientific Affairs, LLC.)

References