Budget Impact of Apremilast for Active Psoriatic Arthritis in the UK

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Background
Psoriatic arthritis (PsA) is a chronic systemic inflammatory disease that has multiple signs and symptoms, including inflamed joints and entheses, as well as psoriasis, and can lead to reduced physical function and quality of life for patients. Effective treatment of PsA has been shown to significantly improve patient outcomes. Apremilast is an orally administered inhibitor of phosphodiesterase 4, and can modulate the aberrant immune response that causes the signs and symptoms of PsA. In January 2015, apremilast, alone or in combination with disease-modifying anti-rheumatic drugs (DMARDs), was approved by the European Medicines Agency for the treatment of PsA in adult patients who have had an inadequate response to or who have been intolerant to a prior DMARD therapy. The objective of this analysis was to assess the budget impact of introducing apremilast in the current treatment portfolio for PsA from the UK payer perspective.

Methods
Model Structure
A 5-year budget impact model was developed using a prevalence-based approach (Figure 1).

The analysis was conducted from the perspective of the NHS in the UK.

Figure 1. Model Design

Patient Population
The target population was estimated based on the total UK population, annual population growth rate, and prevalence of PsA.

The UK adult population size in 2015 and the annual growth rate over the next 5 years was obtained from the Office for National Statistics (ONS).

The prevalence of PsA was assumed constant over 5 years.

Table 1. Patient Population Input Values

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult population in 2015</td>
<td>51,339,161</td>
<td>Office for National Statistics 2010</td>
</tr>
<tr>
<td>Annual population growth rate</td>
<td>0.7%</td>
<td>Office for National Statistics 2010</td>
</tr>
<tr>
<td>Prevalence of PsA</td>
<td>0.05%</td>
<td>NICE 2012</td>
</tr>
</tbody>
</table>

Treatment Options and Uptake of Apremilast
The target population was divided into 3 categories: untreated patients, patients receiving ≥1 conventional DMARD, and patients on biologics.

Conventional DMARDs include methotrexate, leflunomide, and cyclosporine.

Biologics include adalimumab, etanercept, infliximab, golimumab, biosimilar etanercept, and biosimilar infliximab for patients who had an inadequate response to conventional DMARDs.

In the reference scenario (ie, “world without apremilast”), market shares were assumed to be constant over time.

As apremilast is indicated in patients who have failed or are intolerant or contraindicated to conventional DMARDs, in the “world with apremilast”, it was assumed that the uptake of apremilast would cover only those patients who would be eligible for biologic treatment.

Therefore, a proportion of patients who would have received biologics were assumed to be treated with apremilast in the “world with” scenario.

The model assumed an equal displacement of each biologic therapy, ie, the shares taken by apremilast were in the “world with” scenario.

Table 2. Cost Input Values

<table>
<thead>
<tr>
<th>Treatment name</th>
<th>Drug acquisition cost per year</th>
<th>Administration and monitoring cost per year</th>
<th>Total treatment cost per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apremilast (Ostrea)</td>
<td>£110.00</td>
<td>£115.00</td>
<td>£225.00</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>£604.79</td>
<td>£552.40</td>
<td>£1,157.19</td>
</tr>
<tr>
<td>Leflunomide</td>
<td>£684.41</td>
<td>£560.42</td>
<td>£1,244.83</td>
</tr>
<tr>
<td>Golimumab</td>
<td>£101.44</td>
<td>£97.01</td>
<td>£198.45</td>
</tr>
<tr>
<td>Etanercept (Enbrel)</td>
<td>£287.91</td>
<td>£297.91</td>
<td>£585.82</td>
</tr>
<tr>
<td>Infliximab (Remicade)</td>
<td>£6,812.18</td>
<td>£6,742.18</td>
<td>£13,554.36</td>
</tr>
<tr>
<td>Biosimilar etanercept (Benepali)</td>
<td>£1,062.18</td>
<td>£1,062.18</td>
<td>£2,124.36</td>
</tr>
</tbody>
</table>

Drug costs are based on published tender price and may not reflect Patient Access Schemes or locally agreed procurement deals.

The weight of the treatment population was based on an average patient weight of 85 kg obtained in the apremilast trials.

Cost of generic drug used (Mylan Ltd).

Cost of generic drug used (Alliance Healthcare [Distribution]).

Cost of generic drug used (Capimune 100 mg – Mylan Ltd).


Drug acquisition costs were obtained from the National Clinical Guideline Centre (NCGC); physician visit and laboratory test costs were informed by NHS reference costs; the NICE, and published literature.

Cost of drug used (Abbvie Healthcare [Distribution]).

Cost of generic drug used (Eli Lilly & Co). No net savings were assumed.

Table 3. Total Expected Budget Impact

<table>
<thead>
<tr>
<th>Scenario</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>World with apremilast</td>
<td>£185,462,582</td>
<td>£186,292,088</td>
<td>£186,806,044</td>
<td>£186,953,803</td>
<td>£187,678,958</td>
</tr>
<tr>
<td>World without apremilast</td>
<td>£185,052,491</td>
<td>£186,088,044</td>
<td>£186,113,686</td>
<td>£186,576,008</td>
<td>£187,030,469</td>
</tr>
<tr>
<td>Difference</td>
<td>£4,410,091</td>
<td>£2,804,044</td>
<td>£6,252,358</td>
<td>£9,495,365</td>
<td>£10,008,969</td>
</tr>
</tbody>
</table>

CONCLUSIONS
Apremilast is expected to displace a proportion of biologics, offering an alternative option for patients who have failed or are intolerant to conventional DMARD therapy.

The oral self-administration of apremilast is associated with a reduction of the resource use for drug administration compared with IV-administered biologics and a reduction of resource use for monitoring compared with biologic therapy.

Inclusion of apremilast in the PsA treatment regimen in the UK is cost-saving in all respects.

REFERENCES

Acknowledgements
This study was sponsored by Celgene Corporation.

Presented at the 19th ISPOR Annual European Congress; 29 October−2 November, 2016; Vienna, Austria.