Economic Analysis

We identified 25 cost-effectiveness models focusing on biologic therapy for moderate to severe chronic plaque psoriasis. All the included models used chronic plaque psoriasis as their sole model (which only included severe cases) and included individuals with moderate or severe disease.

In 15 of the 25 models, the time horizon after the use of the first-line biologic was not considered.

In 10 of these 15 models, cost-effectiveness was estimated as the cost per responder in a short-term analysis (ranging from 12 weeks to 16 months), with a discount rate often chosen from the market-patent biologics not explicitly considered in the models. Only three models used a long-term horizon, which was assumed to be 10 years in three models, discontinuation from the first-line biologic was assessed by the model or was implicit in the model (e.g., a lifetime decision). In one model, the placebo was the only line of treatment. In four additional models, patients transitioned to an alternative treatment after failure of the first-line biologic without explicitly modeling the treatment.

The time horizons for the cost-effectiveness analyses in those models ranged from 96 weeks to 10 years. For some models, the cost-effectiveness was estimated for the whole cohort or the entire study population. However, for others, the cost-effectiveness was estimated for specific subgroups of patients, such as nonresponder individuals to different therapy strategies. The cost-effectiveness was estimated for various treatment strategies, such as adding a new biologic to first-line therapy or switching to another biologic after failure of the first-line biologic.

Table 1. Summary of Sequencing Methods in Five Economic Models That Considered Sequencing of Biologic Treatments

<table>
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<th>Author, Year</th>
<th>Study Population</th>
<th>Intervention Assumed</th>
<th>Treatment Sequencing</th>
<th>Methodology</th>
<th>Efficiency Analysis for Subsequent Lines of Biologic Therapy</th>
<th>Clinical Data Source</th>
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<tr>
<td>Aria et al., 2011</td>
<td>Patients with severe plaque psoriasis</td>
<td>First-line: adalimumab (80 mg SC) or etanercept (50 mg SC weekly)</td>
<td>First-line: adalimumab (80 mg SC) or etanercept (50 mg SC weekly)</td>
<td>Onset of therapy: 1 week</td>
<td>First-line: adalimumab (80 mg SC) or etanercept (50 mg SC weekly)</td>
<td>Onset of therapy: 1 week</td>
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<tr>
<td>Etaner et al., 2014</td>
<td>Patients with moderate plaque psoriasis</td>
<td>First-line: TNF-alpha antagonist</td>
<td>First-line: TNF-alpha antagonist</td>
<td>Onset of therapy: 1 week</td>
<td>First-line: TNF-alpha antagonist</td>
<td>Onset of therapy: 1 week</td>
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<tr>
<td>Soto et al., 2013</td>
<td>Patients with moderate or severe plaque psoriasis</td>
<td>First-line: TNF-alpha antagonist</td>
<td>First-line: TNF-alpha antagonist</td>
<td>Onset of therapy: 1 week</td>
<td>First-line: TNF-alpha antagonist</td>
<td>Onset of therapy: 1 week</td>
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<td>Yamanaka et al., 2013</td>
<td>Patients with moderate to severe plaque psoriasis</td>
<td>First-line: TNF-alpha antagonist</td>
<td>First-line: TNF-alpha antagonist</td>
<td>Onset of therapy: 1 week</td>
<td>First-line: TNF-alpha antagonist</td>
<td>Onset of therapy: 1 week</td>
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<tr>
<td>Sun et al., 2013</td>
<td>Patients with moderate to severe plaque psoriasis</td>
<td>First-line: TNF-alpha antagonist</td>
<td>First-line: TNF-alpha antagonist</td>
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</tr>
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</table>

Conclusions

Several biologics currently are indicated for treatment of psoriasis, including etanercept, adalimumab, infliximab, and ustekinumab. The Spanish guidelines recommend assessing the response to biologic therapy at weeks 12 through 16 and switching to an alternative agent if no response is obtained. The US guidelines state that there is no specific sequencing for biologics but recognize that loss of response may occur in some patients. The Canadian guidelines do not provide any guidance for choice of the first-line biologic, although the NICE guidelines require a PASI 75 score of greater than 90 or a DLQI score of 10 or greater in order to use first-line biologics.

North America – Recommendations for Treatment Sequencing

The Canadian guidelines provide no guidelines for what to do after failure of the first biologic drug. The US guideline states that there is no specific sequencing for biologics but recognizes that some may experience a worsening of TNF-alpha antagonists, transitioning combination treatment with phototherapy or methotrexate or switching to another biologic. However, the treatment algorithm presented in the most recent NICE guidelines\(^\text{16}\) states combination therapy as the treatment of choice after failure of first-line systemic monotherapy.

Europe – Recommendations for Treatment Sequencing

The European guidelines\(^\text{17}\) do not provide any guidelines on what to do after failure of the first biologic drug. The Spanish guidelines recommend assessing the response to systemic therapy at weeks 12 through 16 and to an alternative treatment regimen if the PASI response is less than 95. The German\(^\text{18}\) guidelines suggest that a second TNF-alpha antagonist can be effective after failure of a first-line TNF-alpha antagonist. These guidelines recommend reusing ustekinumab for use in only individuals with severe psoriasis for whom PASI 75 or PASI 90 was achieved.

The German\(^\text{18}\) guidelines mention the possibility of combination therapy with biologics, but indicate that the evidence is limited in effectiveness in efficacy.

The NICE guidelines state that there is a definite clinical benefit from a second biologic drug but that there is no robust evidence of no improvement in efficacy, and that choice of combination therapy after failure is to respond to a second biologic is limited by lack of evidence.

The German\(^\text{18}\) guidelines\(^\text{11}\) provide criteria for modifying treatment if it has a PASI ≤ 50 or a DLQI score of greater than 5. The German\(^\text{18}\) recommendations for modifying treatment include increasing the dose, reducing the dose, intensity of treatment, and adding a topical or another systemic agent, or changing the drug.

CONCLUSION

Cost-effectiveness models of first-line biologics for severe plaque psoriasis do not include subsequent lines of biologic therapy. Including treatment sequencing in future cost-effectiveness models may increase the usefulness of the estimates to health care decision makers.

Reference