Short and long-term cost-effectiveness of switching therapy from insulin glargine to biphasic insulin aspart 30 in people with type-2 diabetes in Saudi Arabia and India

Objectives

- To assess the cost-effectiveness (CE) of switching therapy from insulin glargine ± oral glucose-lowering drugs (OGLDS) to biphasic insulin aspart 30 ± OGLDS in people with type 2 diabetes (T2DM) in Saudi Arabia and India based on the Achieve® study – an observational study evaluating adverse events and effectiveness of Novo Nordisk insulin analogs in routine clinical practice.
- The Achieve® study is a non-interventional 24-week study including more than 66,000 people with 120M from 28 countries starting either biphasic insulin aspart 30, insulin detemir and/or insulin aspart.
- The CE analyses included data for people switching to biphasic insulin aspart 30 in India (n=195), as well as in seven Arab Gulf countries (n=103) using Saudi Arabia health costs. Data were collected on clinical effectiveness and adverse events, and health-related quality of life using the EQ-5D questionnaire.
- Short-term incremental costs-effectiveness ratios (ICERs) were computed based on incremental cost of treatment and the EQ-5D incremental effect in the first year after switching to biphasic insulin aspart 30.
- Long-term ICERs were simulated using the IMS CORE Diabetes Model with 30-year time horizon including country-specific costs for complications and therapies and background mortality rates.
- ICERs are expressed as cost per QALY in local currencies, USD and in fractions of local GDP per capita. CE was pre-defined using the WHO Choice programme threshold based on GDP per capita.*
- The robustness of the estimated ICERs were tested in a series of sensitivity analyses including, expansion of the simulation time horizon from 30 to 50-years, assuming no deterioration of glucose control with time, assuming median and first quartile distribution of treatment effects on HbA1c, including the costs of self-monitoring blood glucose (SMBG) strips and including the costs of 1 and 2 additional general practitioner (GP) visits in the first year after switching to biphasic insulin aspart 30.

Methods

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Results

- Across all country settings, 100% of the 2000 bootstrap replications of ICERs were dominant based on a 30-year time horizon (see figure 2).
- Predicted life-expectancy increased in both Saudi Arabia (1.79) and India (0.889) (see figure 3).
- The relative risk of developing selected complications was reduced substantially in both countries (see figure 4).

Table 2 Sensitivity analyses presented as fraction of GDP per capita by QALY gained.

<table>
<thead>
<tr>
<th>Country</th>
<th>50-year time horizon</th>
<th>No HbA1c deterioration</th>
<th>Median Treatment effect (HbA1c)</th>
<th>Quarter 1 treatment effect (HbA1c)</th>
<th>Including costs of SMBG strips</th>
<th>1 additional GP visit in the first year after switch</th>
<th>2 additional GP visits in the first year after switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>-0.13</td>
<td>-0.13</td>
<td>-0.13</td>
<td>-0.11</td>
<td>-0.11</td>
<td>-0.13</td>
<td>-0.13</td>
</tr>
<tr>
<td>India</td>
<td>-0.68</td>
<td>-0.68</td>
<td>-0.68</td>
<td>-0.69</td>
<td>-0.38</td>
<td>-0.67</td>
<td>-0.67</td>
</tr>
</tbody>
</table>

Table 2 Sensitivity analyses presented as fraction of GDP per capita by QALY gained.

Conclusions

- Switching therapy from insulin glargine to biphasic insulin aspart 30 in T2DM as performed in the Achieve® study was found to be dominant across both country settings based on a 1 and 30-year time horizon.
- Sensitivity analyses showed the long-term cost-effectiveness to be robust.
- Predicted life-expectancy increased and the relative risk of complications was reduced across all country settings based on a 30-year time horizon.

* Saudi Arabia, Kuwait, Oman, Qatar, Bahrain, United Arab Emirates and Yemen

The World Health Organization (WHO) Choice programme recommends a threshold based on GDP per capita. A health technology is labelled:

- Not cost-effective – if costs ≥ 3 times GDP per capita.
- Cost-effective – if costs ≥ 3 times GDP per capita.
- Slightly cost-effective – if costs ≤ 3 times GDP per capita.

The health technology is referred to as “Dominant” if the costs per 1-year gain are below 0.


References

1. Philip Home, Newcastle University, Newcastle, England
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