Cost Minimization Analysis of U100 insulin and U40 insulin in Egyptian Diabetic Patients

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Background

- Studies estimate that by 2030, Egypt will be the 10th leading country worldwide in terms of number of diabetic patients, which will approximate 9 million patients.
- Complications from diabetes (e.g., Coronary Artery Disease & neuropathy) are resulting in increasing disability, reduced life expectancy, and enormously healthcare costs for all societies specially those in low and middle income countries.

Objective

- The complications for the use of both concentrations U100 insulin (100 units [U]/ml) and U40 insulin (40 units [U]/ml) were not studied in Egypt. The objective of the study was a cost minimization analysis of the two available concentrations for U100 insulin and U40 insulin from the healthcare system's perspective.

Methodology

- A decision analysis model of patients with diabetes was constructed.
- Prevalence rates of diabetes in Egypt and complication rates of both the use of U100 insulin and U40 insulin were obtained from international published sources.
- Direct medical costs were derived from the Ministry of Health tender list.
- All costs were reported in Egyptian pounds of the financial year 2014.
- Deterministic sensitivity analysis was conducted.
- According to data derived from the National Institute for Diabetes and Endocrinology, hospitalization rate accompanying Insulin 40 units administration was high (averaging 40% of the patients for an average of 7 days/year). In contrast, Insulin 100 units doesn't possess such high rate. Its rate was small (3%).
- Costs of hospitalization are variable from one site to another. It averages LE 500, ranging from a low of LE 300 (cases without complications) to LE 1,000 (cases in Intensive Care Unit or Insulin Pump usage).

Results

- Total expected costs for U100 insulin and U40 insulin were LE 262,218,165 and LE 345,582,844 respectively.
- In the base case, the use of U100 insulin displayed a cost advantage over U40 insulin for the treatment of diabetic patients with a minimal percent of complications.
- The model resulted in total savings of LE 83,364,678 in favor of Insulin 100 units.

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<thead>
<tr>
<th></th>
<th>Medicine Cost</th>
<th>Hospitalization Cost</th>
<th>Overall Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin 40</td>
<td>LE 333,311,937</td>
<td>LE 12,270,907</td>
<td>LE 345,582,845</td>
</tr>
<tr>
<td>Insulin 100</td>
<td>LE 253,883,210</td>
<td>LE 8,334,956</td>
<td>LE 262,218,166</td>
</tr>
</tbody>
</table>

- Sensitivity analyses determined that the cost of U100 insulin and U40 insulin had the potential to impact the base case model.

Conclusion

- This cost-minimization study illustrates that Conversion to U100 insulin would result in lower overall treatment costs in patients with diabetes from the healthcare system's perspective.
- An intensive information campaign providing detailed advice for patients, physicians and pharmacists is essential for the prevention of medication errors and reduction of overall costs.

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