Adherence to Diabetes Care in Children and Adolescents with Type 1 Diabetes Mellitus in Spain: Results from the CHRYSTAL Study

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BACKGROUND

CHRYSTAL (Costs and Health Related Quality of Life Study for Type 1 Diabetes Mellitus in Paediatric Patients in Spain) is an observational study conducted in 2014 on a sample of 275 patients aged 0-17 years with Type 1 Diabetes Mellitus (T1DM), distributed across 12 randomly selected sites that treat diabetic children and adolescents in Spain. The sites were distributed across 8 geographical regions grouping Autonomous Communities (Figure 1).

The distribution of the sites and the sample size are representative of the T1DM paediatric population as it is being treated in the country.

The CHRYSTAL study estimated healthcare resource utilization and costs of diabetic children and adolescent, the quality of life of patients and their primary caregivers and the adherence of patients to diabetes care.

One of the objectives of the study was to describe the adherence to diabetes care using the Self-Care Inventory Revised questionnaire (SCI-R), and to compare results by HbA1c level for paediatric patients with T1DM in Spain.

The SCI-R is a brief, psychometrically sound measure of perceptions of adherence to recommended diabetes self-care behaviours of children and adolescents with type 1 or type 2 diabetes.

This poster shows the results obtained from the exploratory endpoint of adherence to diabetes care using the SCI-R in the CHRYSTAL study.

METHODS

Patients 11 years old and over were asked to directly respond to the SCI-R in a single visit. Primary caregivers acted as proxy respondents for children under 11. The SCI-R consists of a 15-item self-report scale (each ranged from 1 to 5, 5 being the highest possible adherence level) to assess patients’ perceptions of their adherence to diabetes self-care recommendations.

Items were classified in the following 5 domains.3

- Diet, which includes: Eat recommended food portions, Eat meals/snacks on time, Keep food records, and Record food intake.
- Glucose monitoring, which includes: Check blood glucose with monitor, and Record blood glucose results.
- Medication administration, which includes: Take correct dose of diabetes pills/insulin, Take diabetes pills/insulin at the right time, and Adjust insulin.
- Exercise, which includes: Exercise regularly.
- Low glucose level, which includes: Treat low blood glucose, and Carry quick acting sugar for lows.
- Preventive / Routine, which includes: Check ketones, Attend clinic appointments, and Wear medical alert.

RESULTS

Adherence scores (mean and standard deviation) for each domain and overall SCI-R score (the average of the domain scores) were calculated. Differences of overall SCI-R score and its domain scores were analysed by HbA1c level, comparing patients with adequate glycosylated control (HbA1c <7.5%, n=161) vs. those with inadequate control (HbA1c ≥7.5%, n=114), using the Mann-Whitney U test.

Table 1 describes sample characteristics.

Table 1. Patient Characteristics (n=275)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD) or %</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean, SD)</td>
<td>10.96 (3.89)</td>
<td>10.0</td>
</tr>
<tr>
<td>Gender (% male)</td>
<td>52.4%</td>
<td>33</td>
</tr>
<tr>
<td>Years from diagnosis (mean, SD)</td>
<td>4.98 (3.24)</td>
<td>4.0</td>
</tr>
<tr>
<td>Puberty status (% post pubertal)</td>
<td>57.3%</td>
<td>11.0</td>
</tr>
<tr>
<td>HbA1c level (mean, SD)</td>
<td>7.42 (0.86)</td>
<td>7.0</td>
</tr>
</tbody>
</table>

SCI-R = Self-Care Inventory Revised

Table 2. Adherence Behavior Scores by Domain

<table>
<thead>
<tr>
<th>Domain</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet</td>
<td>3.94</td>
<td>0.74</td>
</tr>
<tr>
<td>Glucose Monitoring</td>
<td>4.56</td>
<td>0.70</td>
</tr>
<tr>
<td>Medication Administration</td>
<td>4.78</td>
<td>0.36</td>
</tr>
<tr>
<td>Exercise</td>
<td>4.12</td>
<td>0.92</td>
</tr>
<tr>
<td>Low Glucose level</td>
<td>4.51</td>
<td>0.65</td>
</tr>
<tr>
<td>Preventive / Routine</td>
<td>3.18</td>
<td>0.79</td>
</tr>
<tr>
<td>Overall Score</td>
<td>4.13</td>
<td>0.41</td>
</tr>
</tbody>
</table>

Figure 2 shows results by HbA1c level.

Figure 2. SCI-R Scores by HbA1c Level

The SCI-R includes only one item for exercise, which might unbalance the overall scale. Third, the sample size was calculated to power T1DM cost estimation for the study, which was designed, and it might not power the SCI-R adherence endpoint.

CONCLUSIONS

Our results provide the first insight on T1DM self-care behaviour and related problems in the paediatric population in Spain.

The highest reported adherence relates to Medication Administration, Glucose Monitoring and Low Glucose level.

The lowest adherence scores are related to Diet and Preventive behavior.

Higher adherence to Diet and Glucose Monitoring activities is associated with better HbA1c levels.

Our results highlight the importance of improving healthcare programs that target better prevention and diet control in T1DM children in Spain.

Limitations

There are three main limitations to our study. First, as with all studies based on self-report, our results lack a "gold standard" comparison and can only be interpreted in a subjective manner. Second, the SCI-R includes only one item for exercise, which might unbalance the overall scale. Third, the sample size was calculated to power T1DM cost estimation for the study, which was designed, and it might not power the SCI-R adherence endpoint.

Acknowledgements

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References