The prevalence of Type 1 Diabetes Mellitus (T1DM) in Spain is 1.1-1.44 per 1,000 people under 15.1 The social burden of the disease in the pediatric population is unknown.2 The objective of the CHRYSTAL study (Costs and Health Related quality of life Study for Type 1 diabetes mellitus patients in Spain) was to shed light on the social costs of T1DM amongst pediatric patients.

METHODS

CHRYSTAL is an observational study conducted in 2014 on a representative sample of 275 patients aged 0-17 years included in T1DM, distributed across 12 randomly selected hospitals from a list of sites that treat diabetic children and adolescents in Spain.3 The sites were distributed across 8 geographic regions completing Autonomous Communities (Figure 1).

RESULTS

A total of 249 patients were included for analysis (90.5% of all), 26 were excluded because of incomplete information for calculating all the resources identified. Patient characteristics are shown in Table 1.

Table 1. Patient Characteristics (n=249)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean, SD)</td>
<td>11.04 (3.88)</td>
</tr>
<tr>
<td>Gender (% male)</td>
<td>53.0</td>
</tr>
<tr>
<td>Duration of diabetes (mean, SD)</td>
<td>5.52 (3.96)</td>
</tr>
<tr>
<td>Puberty status (% postpubertal)</td>
<td>57.7</td>
</tr>
<tr>
<td>HbA1c, % (mean, SD)</td>
<td>7.43 (0.97)</td>
</tr>
<tr>
<td>Patients using insulin pumps (%)</td>
<td>12.4</td>
</tr>
<tr>
<td>Patients using glucose sensors (%)</td>
<td>6.8</td>
</tr>
<tr>
<td>Number of hypoglycemic episodes in the last month (mean, SD)</td>
<td>11.58 (9.91)</td>
</tr>
<tr>
<td>Number of severe hypoglycemic episodes in the last month (mean, SD)</td>
<td>0.1 (0.41)</td>
</tr>
<tr>
<td>Primary caregiver’s age (mean, SD)</td>
<td>42.72 (6.22)</td>
</tr>
<tr>
<td>Informal care hours/week (mean, SD)</td>
<td>32.97 (29.16)</td>
</tr>
</tbody>
</table>

The average annual cost for a T1DM patient was €27,274, 85.1% corresponds to DNHC (€23,204) and 14.9% to DHC (€4,070) (Figure 2).

Figure 2. Average Annual Costs per T1DM Patient

Medical material and supplies (including glucose meters, insulin pumps, glucose sensors, lancets, blood strips, and other) are the largest DHC (€2,035), followed by Outpatient visits (€641) and Medication (€597).

Figure 3. Distribution of Direct Healthcare Costs

The most important comorbidities were complications (hypoglycemia and T1DM related comorbidities) with a cost of €6,713 for children with complications and/or comorbidities (p<0.05) (Figure 5). There were also significant differences depending on the existence of acute and chronic complications (except hypoglycemia) and T1DM related comorbidities.

Figure 4. Distribution of Direct Non-Healthcare Costs

DISCUSSION

This is the first study that estimates the social cost of T1DM in the population under 18 in Spain and, to our knowledge, the first study that estimates the informal cost of T1DM in the population under 18 in the world.

T1DM carries a considerable social economic burden, especially in terms of informal care. This suggests that any program on health promotion and care for T1DM children cannot overlook the importance of informal support networks.

LIMITATIONS

There are two main limitations to our study. First, The T1DM prevalence approach impedes considering long-term complications of T1DM, which are considered the most harmful and costly. Second, informal care time was obtained by recall method, and is thus subject to recall bias.

CONCLUSIONS

- The cost of informal care represents the largest proportion of the social cost associated with T1DM in the pediatric population in Spain.
- An adequate glycometric control (HbA1c <7.5%) and the absence of T1DM related complications or comorbidities appear to be related with significant direct costs.
- The results shed light on the current allocation of T1DM related resources, and might enlighten T1DM policy priority setting in Spain.

Acknowledgements:
The authors are grateful to the patients and the caregivers who provided their time to complete the CHRYSTAL questionnaires. We also thank all principal and collaborator investigators in patient recruitment and follow-up.

References: