Type 1 diabetes mellitus (T1DM) is associated with the presence of psychiatric disorder compared to general population (33.3% vs 9.7%) [1]. High level of symptoms of psychiatric disorders among adolescents with T1DM increased the odds of inadequate metabolic control, acute complications and subsequent hospitalization [2,3]. Numerous reports on T1DM indicate that reduction of glycated hemoglobin level (HbA1c), risk of acute diabetes related complications, better quality of life and increase in cost-effectiveness can be achieved through the use of continuous subcutaneous insulin infusion (CSII) [4,5]. There are no data, however, concerning the impact of insulin regimen on metabolic control in individuals with T1DM and psychiatric diagnosis neither in adult nor in the pediatric population.

OBJECTIVES

To evaluate the influence of psychiatric co-morbidity and its interaction with insulin regimen on metabolic control and hospitalization time in children with type 1 diabetes mellitus.

METHODS

SAMPLE

The study was a cross-sectional analysis of psychiatric co-morbidity in children with type 1 diabetes participating in a longitudinal observational study. Of 862 children diagnosed as having T1DM in the Lodzkie administrative region in central Poland between 2003 and 2010, 211 (24.5%) met the predefined inclusion criteria: at least 8 years old, duration of diabetes of at least one year, at least three HbA1c measurements per year, and lack of significant coexisting diseases. All patients were dependent on insulin from the time of diagnosis. Of the 211 eligible patients, 176 agreed to participate [81 children treated with multiple daily injections (MDI) and 95 with CSII]. The mean time of observation before psychiatric evaluation was 4.1±1.7 years.

MEASURES

Schedule for Affective Disorders and Schizophrenia for Children (K-SADS-PL)

The K-SADS-PL is a semi-structured diagnostic interview designed to assess current and past episodes of psychopathology in children and adolescents according to DSM-IV criteria. Psychiatric diagnoses were based on the DSM-IV TR criteria and independent interviews with children and one of parent. The interviewer was not involved in diabetes treatment of the patient, had graduate degree in psychology or was a child and adolescent psychiatrist.

HbA1c measures

For each patient, the mean HbA1c level from the preceding year was calculated. HbA1c assays were performed by ion-exchange high-performance liquid chromatography (HPLC) using the Bio-Rad VARIANT™ Hemoglobin A1c Program meeting the Diabetes Control and Complications Trial standard.

STATISTICAL ANALYSIS

Analysis of covariance (ANCOVA) models were used for comparisons of mean HbA1c and the number of hospital days per patient-year with adjustment for duration of diabetes. Type of insulin treatment used over the observation period (CSII or MDI) was included in model to assess possible interaction between psychiatric disorder and form of insulin regimen. 95% Confidence intervals (95%CI) were calculated where possible. Post hoc comparisons using Tukey’s HSD test were performed for pairwise comparisons. A p value of <0.05 was considered as statistically significant. Statistical analysis was performed using Statistica 9.0 (StatSoft, Tulsa, OK, USA).

RESULTS

Table 1 – Characteristics of the study groups according to psychiatric co-morbidity status. CSII: Continuous subcutaneous insulin infusion; MDI: multiple daily injections; HbA1c: glycated hemoglobin.

<table>
<thead>
<tr>
<th>Treatment effects</th>
<th>Psychiatric co-morbidity N=44</th>
<th>No psychiatric co-morbidity N=132</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>18 (41.4)</td>
<td>26 (19.7)</td>
<td>0.0355</td>
</tr>
<tr>
<td>Age at psychiatric evaluation [years]</td>
<td>13.8 (13.0 - 14.5)</td>
<td>13.8 (13.1 - 14.2)</td>
<td>0.6033</td>
</tr>
<tr>
<td>Duration of diabetes at psychiatric evaluation [years]</td>
<td>4.2 (3.8 - 4.9)</td>
<td>4.1 (3.7 - 4.3)</td>
<td>0.2174</td>
</tr>
<tr>
<td>Mean HbA1c in last year (%) (normal range =3.5-7.0%)</td>
<td>8.6 (8.1 - 9.1)</td>
<td>7.9 (7.4 - 7.8)</td>
<td>0.0099</td>
</tr>
<tr>
<td>Days in hospital per year</td>
<td>11.0 (9.4 - 12.5)</td>
<td>7.8 (6.9 - 8.7)</td>
<td>0.0005</td>
</tr>
<tr>
<td>Number of admissions per year</td>
<td>1.4 (1.2 - 1.5)</td>
<td>1.2 (1.1 - 1.3)</td>
<td>0.2961</td>
</tr>
</tbody>
</table>

Table 2 – Metabolic control, quality of life, duration of hospital stay, number of admissions. Data are presented as means and 95% confidence intervals.

CONCLUSIONS

Children with type 1 diabetes mellitus and psychiatric co-morbidity are more likely to have worse metabolic control and have longer hospitalizations than their peers without psychiatric disorders. CSII may be beneficial in such patients.

REFERENCES


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