Depressive Symptoms and Quality of Life in Adolescents With Type 2 Diabetes

Baseline data from the TODAY study

OBJECTIVE—The study objective was to examine the prevalence of depressive symptoms and relationships to quality of life and demographics in the TODAY study’s large, ethnically diverse youth with type 2 diabetes.

RESEARCH DESIGN AND METHODS—A total of 704 youth with type 2 diabetes <2 years’ duration, aged 10–17 years, and BMI ≥85th percentile completed depressive symptoms and quality of life measures.

RESULTS—Some 14.8% reported clinically significant depressive symptoms, and older girls had significantly higher rates than older boys.

CONCLUSIONS—Rates of significant depressive symptoms were similar to those of healthy adolescents and lower than those of teens with type 1 diabetes. Elevated depressive symptoms, particularly in older girls, suggest clinicians assess vulnerability.

Depression in adults is also associated with significant psychosocial and physical complications (2). To date, we have not had access to large samples of patients needed to study depression systematically in youth with type 2 diabetes. TODAY offers unique data concerning the psychosocial functioning of youth with type 2 diabetes.
Statistical methods
Descriptive statistics at randomization are reported as means, SDs, or percents above cutoffs for serious level of depressive symptoms. Analysis of variance or t tests were used to compare mean depressive symptoms and χ² tests for percent above predefined cut points, by sex and race/ethnic group. Pearson correlation coefficients were used to compare the relationship between depressive symptoms and quality of life.

RESULTS—The demographic characteristics of the 704 youth randomized in TODAY have been reported (3). Briefly, girls comprised 65% of the sample, and 61% were aged 12–15 years. More than 80% reported minority race/ethnicity. Participants were overweight or obese, with 87% having a BMI >95th percentile for age and sex. Socioeconomic status was low, with >25% from homes in which neither parent had a high school diploma.

As shown in Table 1, 14.8% of youth reported depressive symptoms above the threshold for clinical significance. No differences in depressive symptom scores were seen across race/ethnicity; however, there were differences by sex (Table 1). BDI was significantly higher in older girls than in older boys, as was the percent scoring at or above the cutoff score for BDI and for CDI and BDI combined. No differences were found in the PedsQL or CDI for either race/ethnicity or sex. Both CDI and BDI were negatively correlated with PedsQL, −0.59 for the CDI and −0.63 for the BDI (both P < 0.001).

CONCLUSIONS—In the TODAY cohort, ~15% scored at or above the cutoff for clinically significant depressive symptoms, a rate similar to that of adolescents without type 2 diabetes (7). Depressive symptoms were not assessed before run-in. Thus, although it is not possible to rule out that completion of run-in had some psychologic benefits for participants, with respect to demographic and depressive symptom characteristics, the TODAY cohort at baseline was similar to youth with type 2 diabetes in the population-based SEARCH study (8,9).

Older female adolescents reported more depressive symptoms in comparison with younger girls and with boys. A post hoc analysis revealed that only a small number of older youth (n = 11, all girls; 1.6%) scored at or above the usual cutoff score (≥29) for “severe” depressive symptoms. This pattern is similar to that of population samples where rates of depression are approximately the same for boys and girls during childhood, but diverge during adolescence when girls have depression rates two to three times higher than boys (10). Current results also are similar to those reported in the SEARCH study, which found that being female and older were risk factors for higher rates of depressive symptoms (11).

Depression is the most studied psychosocial factor in adolescents with type 1 diabetes, with prevalence rates for increased risk of elevated depressive symptoms reported between 14 and 33% (12,13). The risk for depression increases as adolescents with type 1 diabetes develop into young adulthood, with Kovacs et al. (14) reporting that half of young adults with type 1 diabetes followed since adolescence developed a depressive or anxiety disorder.

There were no significant differences in depressive symptom or quality of life scores across racial/ethnic groups in either age group. As expected, lower quality of life scores were significantly related to higher rates of depressive symptoms in both age groups.

Because of the study design, at baseline the TODAY sample was relatively homogeneous, which may limit generalizability. Youth had low socioeconomic status and were predominately minorities, overweight/obese, and in adequate glycemic control at baseline. As the TODAY cohort becomes more heterogeneous over time with respect to glycemic control, BMI, and adherence, baseline depressive symptoms may become important predictors of subsequent treatment outcomes.

Although sample homogeneity is regarded as a study limitation, it is important to note that despite adequate glycemic control at baseline a large percentage of participants also had serious metabolic abnormalities present (3). Moreover, the sex, age, racial/ethnic groups, socioeconomic level, and depressive symptom characteristics of the TODAY cohort are similar to those of the population-based SEARCH study (8,9), which suggests that the TODAY cohort is representative of the population of youth with type 2 diabetes in the U.S.

Table 1—Mean (SD) scores on the PedsQL, CDI (youth aged ≤15 years), and BDI (youth aged ≥16 years), and percent scoring at or above the cutoff score for “serious level of depressive symptoms” on each inventory and for combined CDI and BDI by racial/ethnic group and by sex

<table>
<thead>
<tr>
<th></th>
<th>PedsQL (all ages)</th>
<th>CDI (aged 10–15 years)</th>
<th>BDI (aged ≥16 years)</th>
<th>CDI ≥13 or BDI ≥14 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>N</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Total</td>
<td>689</td>
<td>80.02 (12.04)</td>
<td>513</td>
<td>7.08 (6.36)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian</td>
<td>42</td>
<td>78.23 (13.17)</td>
<td>28</td>
<td>6.50 (7.62)</td>
</tr>
<tr>
<td>Black non-Hispanic</td>
<td>217</td>
<td>79.58 (12.35)</td>
<td>166</td>
<td>7.02 (5.79)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>282</td>
<td>80.54 (11.33)</td>
<td>213</td>
<td>7.38 (6.13)</td>
</tr>
<tr>
<td>White non-Hispanic</td>
<td>137</td>
<td>80.09 (12.44)</td>
<td>97</td>
<td>6.68 (7.41)</td>
</tr>
<tr>
<td>Asian non-Hispanic</td>
<td>11</td>
<td>81.25 (15.08)</td>
<td>9</td>
<td>7.22 (6.22)</td>
</tr>
<tr>
<td>P value*</td>
<td>0.63</td>
<td>0.77</td>
<td>0.99</td>
<td>0.17</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>450</td>
<td>79.49 (12.13)</td>
<td>351</td>
<td>7.19 (6.65)</td>
</tr>
<tr>
<td>Male</td>
<td>239</td>
<td>81.01 (11.83)</td>
<td>162</td>
<td>6.85 (5.68)</td>
</tr>
<tr>
<td>P value</td>
<td>0.11</td>
<td>0.58</td>
<td>0.79</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*P values across racial/ethnic groups were computed without Asian non-Hispanic because of the small sample size.
Type 2 diabetes doubles the risk of depression in adults, with less than 25% receiving adequate depression treatment (15). Given the serious negative physical and psychosocial complications in depressed adults with type 2 diabetes (2,15), clinicians caring for older youth with type 2 diabetes should be familiar with mental health resources. Given the trajectory documented in adolescents with type 1 diabetes and high depressive symptoms for these symptoms to worsen as the older teen transitions into young adulthood, it is imperative to monitor and refer older adolescents with type 2 diabetes and depressive symptoms.

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The writing group takes responsibility for the content of this article: B.J.A. (chair), S.E., N.W.A., L.E.L.K., P.M.Y., P.M.T., S.E.T., S.V.M., T.L.C., and M.D.M. A complete list of the TODAY Study Group can be found in the Supplementary Data.

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B.J.A. and S.E. researched data, contributed to discussion, wrote the manuscript, and reviewed and edited the manuscript. N.W.A. contributed to discussion and reviewed and edited the manuscript. L.E.L.K. wrote the manuscript and contributed to discussion and reviewed and edited the manuscript. P.M.Y. researched data, contributed to discussion and reviewed and edited the manuscript. P.K. reviewed and edited the manuscript. J.L. researched data and contributed to discussion. P.M.T., S.E.T., and S.V.M. researched data, contributed to discussion, and reviewed and edited the manuscript. P.K. reviewed and edited the manuscript. T.L.C. researched data, contributed to discussion, and reviewed and edited the manuscript. M.D.M. contributed to discussion and reviewed and edited the manuscript.

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References