Lifetime Prevalence of Major Depression and Its Effect on Treatment Outcome in Obese Type II Diabetic Patients

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OBJECTIVE — To assess the lifetime prevalence of major depression (MD) and its relation to glycemic control among a group of non-insulin-dependent (type II) diabetic subjects seeking obesity treatment and to determine whether a history of MD affected response to treatment.

RESEARCH DESIGN AND METHODS — Sixty-six obese subjects with type II diabetes (22 men, 44 women) completed the Inventory to Diagnose Depression-Lifetime Version before a 52-wk behavioral weight-control program. Weight, glycosylated hemoglobin, fasting blood glucose, and mood were assessed at pre- and posttreatment.

RESULTS — Thirty-two percent of the subjects reported a history of MD. Neither a history of MD nor current depressive symptoms were associated with pretreatment glycemic control. However, a history of MD was related to treatment attrition (52.4 vs. 22.2%, $P = 0.03$). Subjects with and without a history of MD showed comparable improvements in weight, glycemic control, and mood.

CONCLUSIONS — A history of MD among type II diabetic patients seeking obesity treatment was not related to pretreatment glycemic control but was associated with higher rates of attrition from treatment. Individuals with a history of MD who completed the program did not differ from those with no history of MD in response to treatment.

Studies have indicated that there are high prevalence rates of major depression (MD) among individuals with diabetes (1,2) and that diabetic patients who have had episodes of MD have poorer glycemic control (1). However, these studies have not examined whether a history of MD affects responses to specific treatment interventions. Therefore, in this study, we sought to determine the lifetime prevalence rate of MD in a group of overweight non-insulin-dependent (type II) diabetic patients seeking obesity treatment and whether a history of MD or current symptoms of depression were related to glycemic control and/or whether a history of MD affected outcome in a behavioral weight control program.

RESEARCH DESIGN AND METHODS

— The study consisted of 66 individuals (22 men, 44 women) who were recruited by newspaper advertisements and physician referrals to participate in a year-long weight-control program for adults with type II diabetes. Subjects were required to be 30–70 yr of age, ≥30% and/or 22.7 kg above ideal body weight to meet the National Diabetes Data Group criteria for type II diabetes, and to deposit $100 for participation. Exclusionary criteria were a history of chronic renal failure, cardiovascular disease, myocardial infarction within the previous year, liver disease, or cancer. Mean ± SD age was 52.9 ± 9.5 yr; weight, 103.8 ± 18.4 kg; and body mass index (BMI), 36.9 ± 5.5 kg/m^2. Mean ± SD fasting blood glucose and HbA_1 values were 12.43 ± 3.9 mM and 10.4 ± 2.0%, respectively. Of 66 patients, 10 were treated with diet alone, 38 with oral medication, 14 with insulin, and 4 with insulin plus oral agents.

Subjects were participants in a larger study designed to study the use of two different diet regimens within the context of a year-long behavioral weight-control program for type II diabetic patients. All subjects received the same comprehensive behavior therapy program described in detail elsewhere (3). Preliminary analyses revealed no differences between diet conditions in subject characteristics, attrition, weight

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change, or glycemic control; thus, data presented in this report were collapsed across treatment conditions.

Assessments were completed at pretreatment and at the end of the 52-wk program except where noted. Height and weight were obtained on a balance-beam scale. Subjects were weighed in street clothes without shoes. Fasting plasma glucose was measured at 30, 60, 90, and 120 min after 75-g oral glucose load. Only a fasting plasma glucose measure was obtained at 1 yr. Plasma glucose was analyzed with a Beckman glucose analyzer (Fullerton, CA). HbA_1 was analyzed at the Diabetes Research Laboratory of the Children's Hospital of Pittsburgh. Saline-incubated samples were used to measure HbA_1 by column chromatography (Isolab, Akron, OH) with a water bath at ~22°C and low, medium, and high control samples. The laboratory normal for HbA_1 is 6.1 ± 0.5%. Subjects completed the lifetime version of the Inventory to Diagnose Depression (IDD-L; 4) at pretreatment only. The IDD-L is a self-report instrument that assesses the lifetime prevalence of MD according to criteria of the Diagnostic and Statistical Manual of the American Psychiatric Association and has shown good concordance with a structured psychiatric interview in establishing the diagnosis of MD. Depressive symptomatology was evaluated with the Beck Depression Inventory (BDI), a measure of the severity of depressive symptomatology (5).

Comparisons of proportions between groups were made with χ^2 analyses. Pearson correlations and analyses of variance or covariance were used to compare continuous variables.

RESULTS — Thirty-two percent (n = 21) of patients reported a previous episode of MD. There were no sex differences in the reported rates of MD (36.4% [n = 8] men vs. 29.5% [n = 13] women [χ^2 {df 1} = 0.08, P = 0.8]). Analyses of variance showed that individuals with a history of MD were heavier (BMI = 39.9 vs. 35.6 kg/m^2, F[df 1,64] = 9.9, P = 0.003) and younger at age of diabetes onset (41.6 vs. 47.5 yr old, F[df 1,64] = 4.8, P = 0.03). However, medication regimen did not differ between individuals with and without a history of MD, and a history of MD was not related to current glycemic control as assessed by fasting plasma glucose (12.5 vs. 12.4 mM, P = 0.9) or HbA_1 (10.7 vs. 10.3%, P = 0.5).

Subjects with a lifetime history of MD were also more likely to report depressive symptoms. The BDI score of those with a history of MD was 12.7 compared with 8.7 for those with no history of MD ($P < 0.01$). Depressive symptomatology on the BDI was not related to fasting plasma glucose (r = 0.11, P = 0.36) or HbA_1 (r = 0.12, P = 0.31).

Subjects with and without a history of MD differed significantly in rates of attrition (defined as a failure to attend at least 50% of treatment sessions in the 1st and 2nd 6 mo of the program); 52.4% of patients with a history of MD failed to complete the program compared with 22.2% of those with no history of MD (χ^2 [df 1] = 4.69, P = 0.03). At pretreatment, completers did not differ from noncompleters in weight, HbA_1, fasting plasma glucose, or BDI score.

Analyses of covariance, adjusting for initial weight, indicated that subjects lost significant amounts of weight over time (F[df 2,110] = 88.2, $P <$ 0.0001), but the weight losses of subjects with and without a history of MD (15.6 vs. 13.2 kg, respectively) did not differ (F[df 2,100] = 0.59, P = 0.55). Similarly, there was an overall improvement in HbA_1 from pre- to posttreatment (F[df 2,106] = 26.4, $P < 0.0001$). Individuals with and without a history of MD showed identical HbA_1 changes of −1.5%. An analysis with fasting plasma glucose as the dependent measure showed the same pattern of results. Finally, an analysis of covariance adjusting for initial BDI showed that the self-reported mood of patients improved as a function of participation in the program (F(df 2,100) = 18.8, $P <$ 0.0001. There were no differences in changes of individuals with and without a history of MD; the scores for both groups were in the nondepressed range at posttreatment (8.7 vs. 5.1 for those with and without a history of MD, respectively).

CONCLUSIONS — There are several limitations to this study. First, the IDD-L is a self-report instrument that assesses the presence or absence of at least one episode of MD during the lifetime of an individual without reference to when the episode occurred. Studies with clinician-administered interviews are needed to more reliably establish the diagnosis and timing of episodes of MD. Second, subjects seeking treatment for obesity may not be representative of overweight type II diabetic subjects in general.

Despite methodological shortcomings, this study suggests that type II diabetic patients seeking obesity treatment have lifetime prevalence rates of MD similar to rates for diabetic individuals reported in other studies (1,2). Depressive symptoms on the BDI were also similar to those previously reported (6); however, our data suggest that depressive symptoms may be associated with a history of MD. The BDI scores of individuals with a history of MD were significantly higher compared with those with no history of MD (12.7 vs. 7.8).

In contrast to previous work (1), our data do not show that a history of MD or current depressive symptoms were related to poorer pretreatment glycemic control. The HbA_1 values of individuals with and without a history of MD in this study were not significantly different (10.7 vs. 10.3%). The nonconcordant findings may derive from dif-

ferences in the populations studied, or because episodes of MD reported by subjects in this study were more remote than episodes reported in the previous study. Future research with better assessments are needed to clarify the relationship between depression and glycemic control.

Although a history of MD was not associated with glycemic control, a history of MD appears to have implications for the treatment of overweight type II diabetic patients. More than 50% of individuals with a history of MD failed to complete the year-long program compared with only 22% of those with no history of MD. These findings are consistent with data indicating that a history of MD negatively affects outcome of smoking cessation programs (7). It may be possible to decrease rates of attrition among individuals with a history of MD by increasing therapist support of these patients and/or developing treatment components that focus on their specific problems.

Helping patients to remain in treatment is important because the outcome of individuals who completed treatment was not affected by a history of MD. Patients with and without a history of MD lost comparable amounts of weight and showed equivalent improvements in glycemic control and mood. Additional research is needed to determine whether the benefits of treatment will be sustained in the posttreatment period because it may be that individuals with and without a history of MD differ in vulnerability to weight regain.

In summary, a history of MD and depressive symptomology are common among type II diabetic patients entering a behavioral weight-control program. Attrition rates of individuals with a history of MD are high, but methods to decrease the dropout rates of these individuals are needed because the treatment response of individuals with and without a history of MD who completed treatment was not different.

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