The Influence of Diabetes-related Distress on Depression

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ABSTRACT

Depressive disorders in diabetic patients are nearly twice as likely compared to the non-diabetic population. There is evidence that patients' perception of diabetes is a decisive aspect of this association. Therefore this study prospectively investigates the role of patients' perceived diabetes-related distress on incidence depression and recovery.

343 patients with type 1 diabetes completed the CES-D and the Problem Areas in Diabetes Scale (PAID) at baseline and at the 6-month follow-up. A CES-D score of ≥16 indicated elevated depressive symptoms. A PAID score of ≥30 indicated elevated diabetes-related distress. Logistic regression analyses were performed with recovery from and incidence of depressive symptoms as dependent variables. Independent variable was diabetes-related distress adjusted for possible demographic (age, gender, BMI) and medical confounders (diabetes duration, HbA1c, insulin pump therapy, and late complications).

At baseline 130 patients (37.9%) reported elevated depressive symptoms and 40 of these patients (30.8%) recovered 6 months later. Of the 213 patients without elevated depressive symptoms, 27 (12.7%) had elevated depressive symptoms 6 months later. Diabetes-related distress at baseline diminished the chance to recover from elevated depressive symptoms by 64% (OR = 0.36, p<.05). In addition, the chance for incident depressive symptoms if diabetes-related distress was present at baseline is 2.5 times more likely in contrast to no diabetes-related distress at baseline (OR=2.5; p<.05). In both analyses, no other variables reached a significant influence.
It could be demonstrated that preventing diabetes-related distress is a protective factor regarding the incidence of elevated depressive symptoms. Furthermore, preventing diabetes-related distress supports the recovery from already elevated depressive symptoms. This supports the notion that diabetes per se is not a risk factor for depressive disorders but the perceived emotional distress is.

INTRODUCTION

Several studies and meta-analyses have demonstrated that diabetes is a risk factor for depression. In fact, the prevalence of depressive disorders in patients with diabetes is nearly two times higher compared to people without diabetes. Depressive disorders in patients with diabetes are associated with a poorer quality of life, poorer glycemic control, and a higher risk for micro- and macrovascular complications, higher health-care expenditures, and early mortality. There is evidence that the perception of diabetes rather than the physiological aspects of having diabetes is the driving force behind the heightened prevalence of depression in patients with diabetes. A concept often discussed in the light of patients' perception and psychological burden with diabetes is diabetes-related distress. It can be argued that high diabetes-related distress due to a maladaptation to diabetes will eventually lead to heightened depressive symptoms. This study therefore investigated the effect of diabetes-related distress on the incidence of depressive symptoms as well as the recovery from elevated depressive symptoms.

METHODS

This study was conducted as a prospective study in an outpatient setting. Patients were assessed at baseline and at the 6-month follow-up at their respective practice. Only patients with type 1 diabetes were included in the study. Patients completed the Center for Epidemiological Studies – Depression scale (CES-D) and the Problem Areas in Diabetes scale (PAID). Furthermore, demographic and medical variables were assessed via Case Report Forms (CRF). Elevated depressive symptoms were defined by means of a cut-off score ≥ 16 and elevated diabetes-related distress by means of a cut-off score ≥ 30. Separate logistic regression analyses were used to determine the influence of diabetes-related distress on the incidence of depressive symptoms and the recovery from depressive symptoms. Incident depressive symptoms and recovery from elevated depressive symptoms were the respective categorical dependent variables. Independent variable was elevated diabetes-related distress (categorical variable) adjusted for possible demographic (age, gender, and BMI) and medical confounders (diabetes duration, HbA1c, insulin pump therapy, and late complications).

RESULTS

343 patients completed both questionnaires at baseline and at the 6-month follow-up (age 45.0 ± 13.6 yrs.; 46% female; diabetes duration 16.6 ± 13.2 yrs.; HbA1c 8.2 ± 1.5%; see table 1)

Prevalence and incidence of depressive symptoms (see figure 1):

- At baseline 130 patients reported elevated depressive symptoms, resulting in a prevalence of 37.9%. 6 months later 40 of those patients (30.8%) had a CES-D score below 16 thus having recovered from elevated depressive symptoms.
- Of the 213 patients without elevated depressive symptoms at baseline, 27 had a CES-D score ≥ 16 at follow-up. Therefore, the incidence of elevated depressive symptoms is 12.7%.

Odds Ratios:

The chance for developing elevated depressive symptoms at the 6-month follow-up is influenced by the presence of elevated diabetes-related distress at baseline (see figure 2).

- In the uncorrected model, the chance for incident depressive symptoms when diabetes-related distress was present at baseline was 2.5 times higher than when diabetes-related distress was not present (step 1: OR = 2.51, p<.05, 95% CI 1.08 – 5.85).
- This effect was not altered when controlling for demographic variables (step 2: OR = 2.42, p<.05, 95% CI 1.04-5.75).
- Also, controlling for demographic and medical variables didn't change the significant effect of elevated diabetes-related distress on incident depressive symptoms (step 3: OR = 2.51, p<.05, 95% CI 1.04-6.13).
- Interestingly, no other variables had a significant influence on the incidence of elevated depressive symptoms.

Furthermore, the chance to recover from elevated depressive symptoms is influenced by the presence of elevated diabetes-related distress at baseline (see figure 3).

- In the uncorrected model, if diabetes-related distress was present at baseline the chance to recover from elevated depressive symptoms was reduced by 57% compared to non-present diabetes-related distress (step 1: OR = 0.43, p<.05, 95% CI 0.2-0.92).
- Again, this effect was not altered when controlled for demographic (step 2: OR = 0.39, p<.05, 95% CI 0.17-0.86) and medical variables (step 3: OR = 0.36, p<.05, 95% CI 0.16-0.84). In the third step, the chance to recover from elevated depressive symptoms when diabetes-related distress was present was reduced by 64%.
- The chance to recover from elevated depressive symptoms was 4 times higher when patients had recovered from elevated diabetes-related distress compared to non-recovery from distress (figure 4, step 3: OR = 4.0, p<.05, 95% CI 1.15-14.29).
- No other variables had a significant influence on the recovery from elevated depressive symptoms.

CONCLUSION

This prospective study demonstrates that diabetes-related distress is a risk factor for the development and persistence of depressive symptoms. In turn, the lack of diabetes-related distress is a protective factor regarding depressive symptoms. Thus, by preventing diabetes-related distress the incidence of sub-threshold depression can be prevented. Furthermore, even the recovery from elevated depressive symptoms can be facilitated by preventing diabetes-related distress in the first place. These effects are independent and not mediated by demographic or medical confounders. One limitation of this study is the fact, that depressive symptoms were assessed via self-report and not via interviews according to DSM-IV. Nevertheless, it seems promising to develop treatment strategies targeting diabetes-related distress in order to prevent depressive disorders. In summary, this study supports the notion that diabetes per se is not a risk factor for depressive disorders but the perceived emotional distress of having diabetes is.

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Table 1: Sample Characteristics

	type 1 diabetes (n=343)
mean age (± SD) in years	45.0 ± 13.6
gender	46% female
mean diabetes duration (± SD) in years	16.6 ± 13.2
mean HbA1c (± SD) in %	8.2 ± 1.5
mean BMI (± SD) in kg/m²	26.7 ± 5.2
# on insulin pump therapy	71 (21%)
# with late complications	138 (40%)

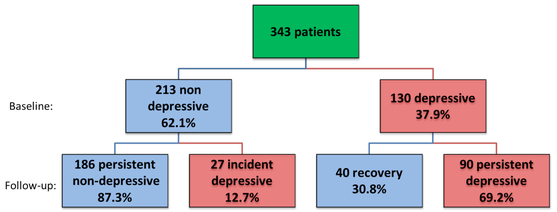

Figure 1: Prevalence of, incidence of, and recovery from depressive symptoms.

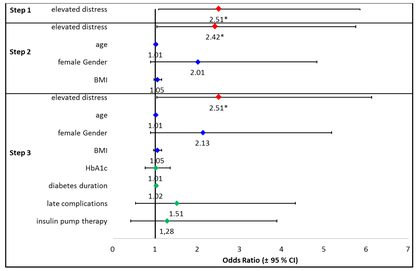

Figure 2: Odds ratios for the incidence of elevated depressive symptoms. Baseline values. Step 1 = uncorrected model; Step 2 = corrected for demographic variables; Step 3 = corrected for demographic and medical variables; * p < .05.

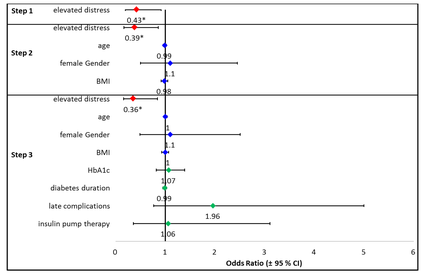

Figure 3: Odds ratios for the recovery from elevated depressive symptoms. Baseline values. Step 1 = uncorrected model; Step 2 = corrected for demographic variables; Step 3 = corrected for demographic and medical variables; * p < .05.

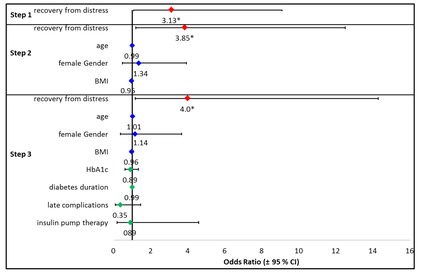

Figure 4: Odds ratios for the recovery from elevated depressive symptoms when recovering from elevated diabetes-related distress. Step 1 = uncorrected model; Step 2 = corrected for demographic variables; Step 3 = corrected for demographic and medical variables; * p < .05.