

Can Stress Management Improve Glycemic Control in Type 2 Diabetes?

Surwit RS, van Tilburg MA, Zucker N, et al. Stress management improves long-term glycemic control in type 2 diabetes. Diabetes Care 2002;25:30-4.

Study Overview

Objective. To evaluate whether a group-based stress management training program could improve glycemic control in patients with type 2 diabetes.

Design. Unblinded randomized controlled trial.

Setting and participants. 108 adult patients with type 2 diabetes were recruited to participate in a study of "stress and diabetes" at an academic medical center. None of these patients was undergoing active psychiatric treatment or taking psychoactive medications. Patients randomized to the intervention group were asked to attend 5 weekly small-group sessions, during which they were instructed on general diabetes care and stress management techniques (progressive muscle relaxation and the application of cognitive and behavioral skills to reduce stress). Patients randomized to the control group only received general diabetes care instruction during their 5 weekly small-group sessions. Patients in both groups were removed from the study if they missed more than 1 small-group session. All patients continued to be followed by their private physicians during the 1-year study period.

Main outcome measures. Glycosylated hemoglobin (HbA_{1c}) was measured for all patients at baseline and at 2, 4, 6, and 12 months. Perceived stress, anxiety, physical activity, and general health were assessed using validated tools at baseline and during follow-up, as were patient weight and dietary intake.

Main results. 36/108 patients recruited initially did not complete the study because of noncompliance to the intervention or follow-up protocol. Baseline assessment showed that patients randomized to the intervention group had statistically higher HbA_{1c} and daily caloric intake than those randomized to the control group. Baseline levels of stress and anxiety were similar between the 2 groups. After adjusting for baseline differences in HbA_{1c} between the 2 groups using mixed-model regression analysis, the authors found that HbA_{1c} levels were 0.5% lower in the intervention group compared with the control group (details of the model not provided). The authors also discovered that patients in the intervention

group did not have any statistically significant change in stress, anxiety, diet, or physical activity during the follow-up period.

Conclusion. The authors asserted that stress management training resulted in a small but statistically significant reduction in HbA_{1c} for patients with type 2 diabetes.

Commentary

There is conflicting evidence regarding the utility of stress management training in the treatment of diabetes. Given the prevalence of poor glycemic control in the community and the relatively low cost of this intervention, this study had the potential to settle this important issue. At face value, the results are encouraging. The authors found that their relatively simple intervention resulted in a 0.5% drop in HbA_{1c} 12 months after the intervention. While this magnitude in HbA_{1c} improvement is small, it is comparable to the effects of such agents as α -glucosidase inhibitors and has been associated with a reduction in microvascular complication risk.

Unfortunately, a closer examination of the data brings the validity of this result into question. As the authors discussed, patients in the intervention group had poorer glycemic control and higher caloric intake at baseline than patients in the control group. This difference at baseline suggests that the randomization process was imperfect and allowed potential confounders to exert differential effects on the 2 study groups. Normally, statistical adjustments could mitigate this potential source of bias. However, important potential confounding variables (eg, baseline medical regimen, medication and dietary compliance, socioeconomic status, and the number of years with diabetes) were not measured in this study and therefore could not be controlled for.

It is also unclear how the authors accounted for patients who dropped out of the study because of noncompliance to either the intervention or follow-up. It is interesting to note that the study eliminated more patients in the intervention group than in the control group. This trend could have biased the study result towards showing an effect, as the remaining patients were more likely to be compliant and compliant patients were likely to achieve better glycemic control through

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efforts unrelated to the intervention. Since the authors did not state whether they performed an intention-to-treat analysis on the data, we need to be concerned with this potential source of bias.

Another result arising from this study is also puzzling. The authors found that patients in the intervention group did not show any change in their stress and anxiety levels despite moderate improvement in HbA_{1c}. The premise of the study rests upon the efficacy of the stress management intervention to reduce patients' stress, and it is unsettling to see that the intervention failed to achieve its basic intended effect. While the absence of an effect seen on stress and anxiety levels could be attributed to the lack of statistical power, this logical inconsistency in the data casts doubts on the quality of this study.

Even if these issues of validity can be addressed, it is important to note that the authors excluded patients who were on insulin therapy or who had active anxiety disorders. Therefore, the results of this study cannot be applied to patients who would most likely benefit from glycemic control and/or stress reduction.

Application for Clinical Practice

Given the severe limitations of this study, the authors have not convincingly demonstrated the benefit of stress management for glycemic control for type 2 diabetic patients. Further research is needed before this modality can be recommended on a routine basis.

—Review by Eric G. Poon, MD

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