

Reducing stress in adolescents with diabetes: what can be done?



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Diabetes management is complex and demanding. Compound diabetes management with adolescence, depression, diabetes distress, or all three, and effective management can be elusive. For example, adolescents in the landmark Diabetes Control and Complications Trial [1] benefited from intensive insulin management, yet their hemoglobin A1c values remained substantially higher than the treated adults. Factors such as growth and puberty [2,3], and developmental demands and psychological functioning [4–6], contribute to this common occurrence of sub-optimal glycemic control in adolescents worldwide [7,8]. Furthermore, recent evidence confirms the implicit assumption that ineffective diabetes management (i.e., poor adherence) is linked to higher A1c values in pediatric Type 1 diabetes [9]. As healthcare professionals, working to promote diabetes outcomes in the children and adolescents we work with, we understand this unfortunate state of affairs. Given the negative impact of stress on diabetes management and outcomes in adolescents with diabetes, what can be done to reduce stress?

What we know

Clinical research on the link between diabetes and stress, along with clinical practice, has taught us the following:

- An adult with Type 1 or Type 2 diabetes has a twofold greater risk of becoming depressed, compared with individuals without diabetes [10];
- Similarly, adolescents with Type 1 diabetes experience a two- to three-fold increased risk of depression [6,11] (of note, data on adolescents with Type 2 diabetes are lacking, but preliminary evidence suggests an elevated risk [12]);
- Worries (e.g., about hypoglycemia) and general anxiety are also common in pediatric patients with Type 1 diabetes [13,14];
- Depression, diabetes distress and anxiety (all grouped together as ‘stress’) are associated with poor adherence, suboptimal glycemic control and increased healthcare utilization [15–18].

Elevated risk for stress in individuals with diabetes has largely been attributed to the presence of diabetes and the burden of

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its management. Indeed, the studies cited above confirm this link, as well as new research on diabetes distress (i.e., distress specifically related to diabetes and/or its management) [19]. However, we cannot fully explain these links by environmental pathways. Emerging data in adults with diabetes implicates depression as a major risk factor for the development of Type 2 diabetes [20] and there are data that highlight systemic inflammation and neuroendocrine pathways, such as the hypothalamic–pituitary–adrenal axis, as potential biologic pathways between diabetes and stress [21]. In the first results on these links in pediatric patients with diabetes, our research team found that a host of metabolic and inflammatory markers are linked with depression, and that there were tight links between depression and dyslipidemia [22]. While much work remains in the ‘biologic’ arena of the diabetes–stress relationship, further discussion is beyond the scope of this article. In addition, our efforts to reduce stress in adolescents with diabetes are all based on environmental targets in the individual, family or system.

What we need to do

The direct aim of reducing stress in adolescents is exactly that; the indirect aims are to improve diabetes management and glycemic control, and furthermore, to reduce their risk of long-term microvascular and macrovascular complications. There are three parts to the process of reducing stress in adolescents with diabetes: screening, treatment and prevention.

■ Screening

Screening for stress is recommended in practice guidelines for the American Diabetes Association [23] and the International Society for Pediatric and Adolescent Diabetes [24], as well as by a number of individual pediatric diabetes teams around the world [25]. However, implementation of screening has lagged behind. This can be explained, in part, by logistical barriers. For example, effective screening requires qualified individuals, such as psychologists, social workers or psychiatrists, to interpret the screening results. These individuals are not always available in pediatric clinics, although they should be. Furthermore, there is cost associated with screening in terms of actual dollars as well as potential disruptions in clinic flow. Finally, a plan needs to be in place for addressing the stress discovered during screening.

Again, qualified individuals need to be available to provide further assessment of the stress and/or treatment.

Recently, our team at the Cincinnati Children’s Hospital’s Diabetes Center, OH, USA, began the process of implementing depression screening. The guidelines we followed were: first, we chose a targeted group for initial implementation, that is, adolescents with Type 1 diabetes; second, we chose a depression survey to use. We did this based on costs of the measure, item content, and reliability and validity. We chose the Children’s Depression Inventory (CDI) [26] over other measures because our cost–benefit assessment identified this as the best measure for our needs. Third, we worked collaboratively with a data capture and management team in our hospital to use forms and technology to avoid disruptions in clinic flow, which is of paramount importance in a busy, tertiary pediatric diabetes center. Our forms are produced in a scannable format and the scanning is completed by the nursing team. The printout from this includes the depression score and instructions for what action the practitioner should take based on our predetermined algorithm for further assessment and treatment (e.g., the cut-off score for referral to treatment). Finally, we made sure there were adequate resources for immediate screening (in the case of suicidal ideation) and referrals for psychological treatment. Our plan is to optimize our screening process in this age group before expanding to other ages and patients with Type 2 diabetes.

■ Treatment

Screening is useless in the absence of adequate resources to treat stress. Adequate resources include people to provide the service as well as an evidence base on effective treatments. There are limited data on the treatment of stress, specifically in adolescents with diabetes; however, we are able to draw on treatments for adults with diabetes and treatments for adolescents in general.

Which treatments are most effective in reducing stress?

Treatments that include cognitive–behavioral and problem-solving components demonstrate the most promise. A number of teams have shown significant benefits on stress, diabetes management and glycemic control in adults with diabetes, largely Type 2, when cognitive–behavioral therapy (CBT) is used [27,28]. Learning strategies to address cognitive distortions (e.g., ‘diabetes is overwhelming, I can’t manage it’) and carry out

health behaviors (e.g., checking blood sugars and responding appropriately) are examples of effective components of these treatments. Another source of evidence for the effectiveness of CBT for adolescents in general comes from the Treatment of Adolescents with Depression Study. In this study, the most effective treatment for diagnosed depression in adolescents (it should be noted, this is more severe than the ‘stress’ discussed thus far) is a combination of fluoxetine and CBT [29]. Although CBT failed to show considerable benefit at the immediate end of treatment, the long-term benefits toward remission of depression were robust [30]. The promotion of problem-solving strategies proved to be a driving force for long-term success with CBT. Although it is not diabetes-specific, the CBT manual from Treatment of Adolescents with Depression Study is freely accessible [101].

Our research team is conducting a randomized, controlled trial of a stress reducing, adherence-promoting intervention for adolescents with elevated depressive symptoms. The intervention has two phases. In the first, we attempt to reduce depressive symptoms via promotion of cognitive-behavioral strategies and problem-solving in groups of adolescents. In the second phase, efforts to promote diabetes adherence are made by working with the adolescent-parent dyad on breaking down barriers to adherence and developing diabetes-specific problem solving. This intervention is clinically informed and anecdotal clinical evidence indicates positive outcomes when attempts to reduce stress are conducted, prior to attempts to promote adherence. Data from the trial should be available by January 2012.

In summary, when stress is identified, cognitive-behavioral and problem-solving interventions should convey the most benefit. Once stress is reduced, efforts to promote diabetes management, and ultimately glycemic control, should be more effective. If CBT or problem-solving manuals are accessible, it may be appropriate to adapt material to fit with the disease-specific context of diabetes management.

■ Prevention

The alternative to reducing stress via treatment is to prevent the development of stress. At present, there are no programs that specifically target stress prevention in adolescents with diabetes. However, depression prevention programs do show considerable benefit for adolescents in general [31]. Many of these programs include similar components as the effective interventions described before and

focus on preparing adolescents to appropriately cope with the adversity that arises. These themes would probably translate well to pediatric patients with diabetes.

If large-scale prevention programs are not available, several strategies could be employed in the clinic to reduce the risk for developing stress. They include:

- Routine discussion at clinic visits of increased risk for stress in adolescents with diabetes;
- Description of ‘warning signs’ of stress, including feeling frustrated with diabetes, frequent worrying, not enjoying activities usually enjoyed and sad mood;
- Request parents and family members to ‘check-in’ with the adolescent regarding any frustrations, worries or diabetes distress;
- Monitor for dramatic shifts in diabetes management (e.g., checking blood sugars once a day after doing it five-times daily for months) and glycemic control (e.g., sharply increasing A1c values across two clinic visits);
- Suggest to adolescents and parents that they share responsibilities with management and identify specific areas for teamwork.

Summary

Stress complicates diabetes management and promotes poor outcomes. In this era of intensive management of diabetes, there is greater risk for stress given the complex and demanding nature of management. Considering this elevated risk, efforts to prevent and reduce risk should carry considerable benefit for the adolescent’s psychological functioning, as well as diabetes-specific health outcomes. The next steps are to continue to build the evidence base of effective interventions and implement them in clinics. If we are successful at that, more adolescents will achieve optimal diabetes management and glycemic control, which seems unattainable at this time.

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Website

- 101 Treatment for Adolescents with Depression Study <https://trialweb.dcri.duke.edu/tads/manuals.html>