Pilot Study Results for a Novel Behavior Plus Nutrition Intervention for Caregivers of Young Children With Type 1 Diabetes

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ABSTRACT

Objective: To present results for a parent-based educational intervention targeting mealtime behaviors plus nutrition among families of young children (mean age, 5.0 ± 1.2 years) with type 1 diabetes mellitus (T1DM).

Methods: The researchers recruited 9 caregivers who participated in the 6-session intervention and completed baseline and posttreatment assessments, which included dietary intake, acceptability of diet changes, mealtime behavior, and mean blood glucose values.

Results: Children's mean daily blood glucose levels decreased from 185 ± 46 mg/dL to 159 ± 40 mg/dL ($P < .001$). There were also decreases in problematic parent and child mealtime behaviors. There was no change in children's dietary intake indicators that could be detected.

Conclusions and Implications: It appears promising that this targeted behavior plus nutrition intervention can improve glycemic control and behavior for young children with type 1 diabetes mellitus. Larger, randomized controlled trials will clarify significant results, limitations, and sustainability. Techniques within the program may have application to current practice.

Key Words: nutrition, behavior, child, preschool, diabetes, glycemic control (*J Nutr Educ Behav*. 2014;46:429-433.)

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INTRODUCTION

Young children with type 1 diabetes (T1DM) are understudied in behavioral treatment outcomes research, despite evidence suggesting that the incidence of T1DM is increasing in young children.[1,2] Caring for a young child with T1DM is challenging because young children are more vulnerable to hypoglycemia.[3,4] In addition, young children can be highly unpredictable in their eating and activity levels, which can complicate dietary planning and insulin administration.[5,6] Unfortunately, the available literature suggests that many young children with T1DM experience problems with glycemic variability and do not achieve targets for measures of chronic glycemia: namely, glycated hemoglobin (HbA1c).[4,7] Mealtime behavior problems have been commonly reported by parents of young children with T1DM and have been shown to correlate with higher daily glucose levels in children.[8,9] Also, studies have shown that many young children with T1DM do not consume a healthful diet, which is also related to poor glucose control.[5,10] Although there are interventions focused on improving support and coping in parents of young children with T1DM,[11,12] an intervention directly addressing child health outcomes has not yet been developed specifically for these parents.

Behavior and Eating Strategies that Make Eating Activities Less Stressful (BEST MEALS) was created to provide a parent-based behavior plus nutrition education intervention for young children. Drawing from clinical experience, the Health Beliefs Model,[13] and an existing intervention developed for cystic fibrosis,[14] the 6 weekly sessions of BEST MEALS address age-specific diabetes education topics, healthful eating practices for T1DM, and behavioral parent training, to promote greater parental knowledge of T1DM and perceived self-efficacy to change maladaptive T1DM care strategies (Table 1). Mealtimes were selected as the primary intervention target based on the extant literature[8,15] and because mealtimes are a specific goal-directed activity that occurs at multiple and distinct times each day, thus providing parents with frequent practice opportunities. Parents were targeted for the intervention because they have a primary role in caring for their young child's T1DM.[3]

This research brief provides pilot results from BEST MEALS. The primary outcome tested was a change

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Table 1. Description of Behavior and Eating Strategies That Make Eating Activities Less Stressful (BEST MEALS) Intervention

Session	Topic	Content	Format
1	Introduction/self-monitoring	Rationale of BEST MEALS; write out family daily/weekly routines related to type 1 diabetes management; set goals for treatment	Slide presentation; group discussion; handouts
2	Insulin management/glucose targets	Insulin types/action; insulin dose calculations; glucose targets for young kids; challenges to type 1 diabetes management	Slide presentation; group discussion; handouts
3	Child behavioral management–I	Contingent attention; applying contingent attention at meals; specific behaviors to praise vs ignore; direct requests vs indirect requests or coaxes	Slide presentation; video clips modeling praise/ignoring; group discussion; handouts
4	Carbohydrate counting/building a healthy plate–I	Review steps to count carbohydrates; American Diabetes Association recommendations for fat and saturated fat intake; recognizing/reducing daily fat intake	Slide presentation; group discussion; food labels; sample menus; handouts
5	Building a healthy plate–II and introducing new foods	Review recommendations for daily fat intake; review strategies for recognizing/reducing daily fat intake; contingent attention to introduce new foods and non-preferred foods	Slide presentation; video clips modeling introduction of new/non-preferred foods; group discussion; handouts
6	Maintenance/supporting a healthy lifestyle	Review recommendations for daily physical activity; helped families create list of physical activity options; discussed other problem behaviors at meals	Slide presentation; group discussion; activity to develop family physical activity lists; video clips modeling some other problematic behavior at meals (ie, child only eating if he or she is reinforced); handouts

in child mean daily blood glucose concentration, and the authors hypothesized that participation in BEST MEALS would result in lower daily glycemic levels. Secondary outcomes were change in family mealtime behaviors and child dietary intake. Acceptability and feasibility data were also collected.

METHODS

Participants

Families were recruited from a hospital-based diabetes clinic in the Midwestern US. All families had previously indicated an interest in participating in clinical research. Parents or primary caregivers were eligible to participate if they had a child between 2 and 6 years of age with a T1DM diagnosis made at least 6 months previously, and if the child was following an intensive insulin regimen (insulin pump or multiple daily injections), the child was not sick with another serious chronic illness (eg, liver disease), and the parents spoke English. Thirteen families were recruited, 10 initially agreed to participate, and 9 enrolled in the study and completed study measures (70% participation rate). The 3 families that refused to participate cited time and the necessity of having to travel to the medical center for the group sessions as the primary reason for refusing participation. One family agreed to participate, but in the end, it was unable to participate because of a scheduling conflict.

Procedure

The authors obtained approval from the University of Kansas Medical Center and Children's Mercy Hospital Institutional Review Boards before starting the pilot study, and all parents provided written consent at enrollment. Families participated in 2 home study visits at baseline and posttreatment and parents attended the 6 session group–based BEST MEALS intervention. Study assessments included parent-completed diet records, video-recorded home dinners, and children's blood glucose data as recorded by their home glucose meters. The video-recorded home meals were completed during each study visit (1 dinner meal at baseline and posttreatment, respectively). After each video-recorded home meal, caregivers rated how typical the meal was, using a survey that asked about meal length, child behavior, foods consumed, and people present at the meal. Meals rated as non-typical were supposed to be replaced based on a standard protocol.[16] However, in the current sample, no