Nutrition Intake in Youths with Type 1 Diabetes

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BACKGROUND

• For youth with type 1 diabetes (T1D), adolescence is often characterized by a period of poor adherence.
• One reason for poor adherence may be related to youth establishing their independence, including making more of their own nutritional choices1.
• High quality nutrition is strongly recommended to improve health (e.g., lower LDL plasma levels), and potentially off-set risk factors for cardiovascular (CV) disease in individuals with diabetes2.
• The goal of the current study was to evaluate the rates of adherence to nutritional guidelines in youths with T1D and to examine the association between nutritional quality and HbA1c.

METHODS

• Baseline data from a randomized controlled trial (RCT) of an intervention designed to prevent deterioration of glycemic control in youths with T1D were evaluated.
• Adolescent-parent dyads (N = 257, youth mean age = 12 years, SD = 1.2 years, 49.4% female, 64% intensive insulin regimen, mean HbA1c = 8.8, SD = 1.6) reported on youths’ dietary intake via two 24-hour recall interviews as a component of their diabetes self-care.
• Participants were stratified by insulin regimen. Participants who reported 4 or more injections or use of a insulin pump were considered intensive. Conventional therapy involved a more structured insulin regimen including a set amount of carbohydrate and insulin intake per meal and fewer injections. Intensive therapy offered greater flexibility with calculating insulin needs, based on insulin to carbohydrate ratios, for each food consumed.
• Dietary intake was scored using The Food Processor® Nutrition Analysis Software (ESHA Research, Salem, OR, USA).
• Demographic variables and hemoglobin A1c were abstracted from questionnaires and medical record reviews.

TABLE 1: Guidelines for Adolescents with Type 1 Diabetes

| % calories from carbohydrates | 50-55% |
| % calories from protein | 15-20% |
| % calories from fat | 30-35% |
| % saturated fat | <7% of total calories |
| Polyunsaturated fat | <10% |
| Monounsaturated fat | 10-20% |
| Cholesterol | <200mg/day |
| Dietary Fiber | 14g/1000kcal |
| Overweight 85th – 94th percentile (25.0 - 29.9 kg/m2) | ADA2|
| Obese ≥ 95th percentile (≥ 30kg/m2) | ADA2|
| 130/80mmHg or 90th percentile for age, sex & height | ADA2|
| LDL cholesterol | <100mg/dL |

% saturated fat <7% of total calories ADA2
% calories from fat 30-35% ISPAD3
% calories from carbohydrates 50-55% ISPAD3
Polyunsaturated fat <10% ISPAD3
Monounsaturated fat 10-20% ISPAD3
Cholesterol <200mg/day ADA2
Dietary Fiber 14g/1000kcal ADA2, HP20104

RESULTS

• When compared to the American Diabetes Association (ADA) and the International Society for Adolescent and Pediatric Diabetes (ISPAD) recommendations, many youths were not meeting nutritional guidelines (Table 1; Figure 1). This includes percent daily intake of protein, carbohydrates, fat, saturated fat, cholesterol and dietary fiber.
• Further, 50.2% of youth had LDL cholesterol levels greater than recommended guidelines for primary prevention of CV disease in youths with T1D.
• Significant positive correlations were found between HbA1c and percent of total calories from fat (r = .24, p < .01), polyunsaturated fat (r = .16, p < .05), dietary cholesterol (r = .20, p < .01), and LDL cholesterol (r = .24, p < .01).
• Significant negative correlations were identified between HbA1c and percent of total calories from carbohydrates (r = -.23, p < .01) and dietary fiber (r = -.13, p < .05).

NEXT STEPS

• The majority of early adolescents with T1D did not meet nutritional guidelines. This may place them at increased risk for CV diabetes-related complications, which was suggested by increased LDL plasma levels reported in this adolescent study population.
• Further, several indices of nutrition were associated with glycemic control, suggesting that there may also be short-term impact linked to failure to adhere to nutritional guidelines.
• Diabetes education efforts regarding healthy eating and dietary management may need to be enhanced to achieve recommendations and ultimately improve youth health outcomes.

REFERENCES