

STRONG CHILDREN'S RESEARCH CENTER

Summer 2016 Research Scholar

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ABSTRACT

Title: *Assessment of Calcium Intake in the Pediatric Type 1 Diabetes Population*

Background: Patients with either Type 1 (T1D) or Type 2 diabetes (T2D) are more apt to suffer a bone fracture than patients without diabetes. The risk of fracture is greater for patients with T1D than T2D. Compared with patients with T2D and people without diabetes, patients with T1D have been shown to have lower bone densities, which may contribute to their increased fracture risk. Calcium is important in bone mineralization and ascertainment of normal bone density. These observations raise the possibility that T1D patients, compared to patients without diabetes, have low calcium intake, elevated calcium excretion or altered calcium metabolism, contributing to low bone density and increased risk of fracture.

Objective: To compare the calcium intake of the pediatric T1D population at the URM Pediatric Endocrine outpatient clinic to an age-matched representative sample of US children.

Methods: 103 participants between the age of 7 and 22 years were interviewed at their diabetes follow-up appointment at the Pediatric Endocrine outpatient clinic. Dietary calcium intake was assessed using a validated Calcium Food Frequency Questionnaire (FFQ). Medical and family history was assessed by participant interview, T1D history by chart review. Glycemic control was assessed by hemoglobin A1c (A1c) at date of visit and also by three year average. Dietary calcium intake in T1D participants was compared to age-matched dietary calcium intake data obtained from the National Health and Nutrition Examination Survey 2011-2012. Standard descriptive statistics were used to describe participant characteristics and outcomes. Means were expressed (range) and compared using t-tests; medians as (interquartile range) and compared using Wilcoxon rank sum tests. Chi-square test was used to compare proportions. A two-sided p value of <0.05 was used to define significance for all analyses.

Results: The T1D participant population, comprised of 103 participants, had a median age of 14.9 years (11.1, 17.8), was 54% male, 80.6% white, and had a median disease duration of 5.1 years (2.11, 9.17). The T1D patients consumed significantly more calcium than the NHANES control group. Median calcium intake from diet in Type 1 Diabetes patients compared with the median of normal controls was 1573 mg versus 927 mg, respectively ($p < 0.0001$). Additionally, 72.8% of the pediatric T1D patients met the RDA for calcium intake compared to 41.5% of the NHANES group ($p < 0.001$). Among Type 1 Diabetes patients, there was no association between various predictors of calcium intake (sex, glycemic control, or fracture history) and those who met the RDA for dietary calcium ($p = 0.586, 0.664, 0.384$, respectively).

Conclusion: We found that the majority of T1D participants at URM were meeting the RDA for calcium intake. T1D related factors such as glycemic control and duration of disease were not associated with calcium intake. Our results also suggest that T1D participants consumed greater amounts of dietary calcium compared to the general childhood population, however comparisons are limited due to different methodology used to assess intake. Future studies are needed to understand why calcium intake may be increased in T1D, and also to determine the relevance of dietary calcium intake to bone health in T1D.