

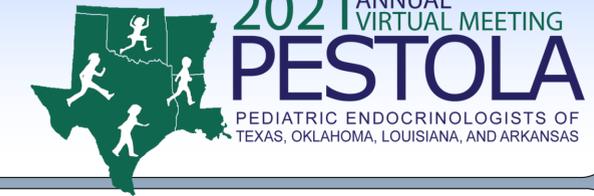


Overlap Between Characteristics of Type 1 and Type 2 Diabetes in Children

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Introduction

Type 1 diabetes (T1D) is the most common type of diabetes in children, but the frequency of type 2 diabetes (T2D) is increasing rapidly (1). Classification of diabetes type is currently based on the presence of a constellation of features that are typical of each diabetes type (2). However, clinicians face challenges to classify diabetes type at the time of diabetes diagnosis (3).

Hypothesis

We hypothesized that there is overlap between T1D and T2D characteristics at the onset of pediatric diabetes. To test our hypothesis, we compared clinical characteristics at diabetes diagnosis of children with T1D or T2D.

Methods

We studied children who attended a large academic hospital in Houston, Texas (USA) with a new diagnosis of T2D (n=754) or T1D (n=759).

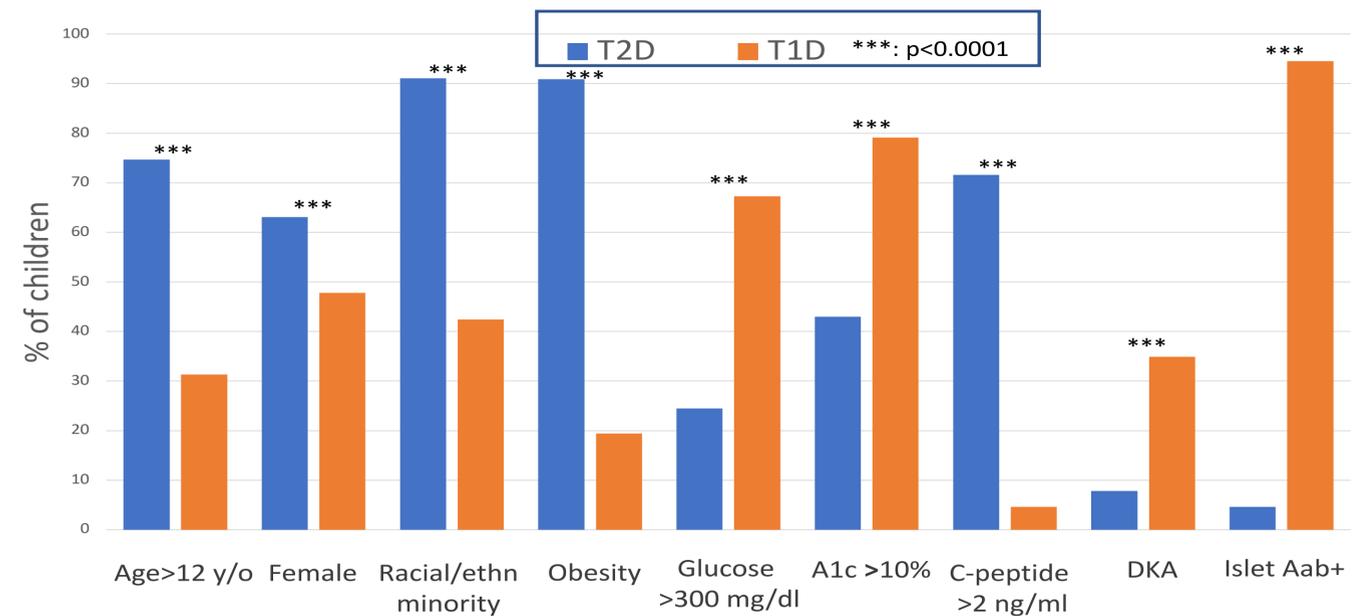
We compared age, sex, race/ethnicity, presence of obesity, glucose, hemoglobin A1c, islet autoantibodies, C-peptide, and presence of diabetic ketoacidosis (DKA) at the time of diabetes diagnosis.

Results (I)

At diagnosis of diabetes, children with T2D, compared with those with T1D, were older (13.6 vs 9.8% years old), more likely females (63.1% vs 47.8%), of racial or ethnic minority background (87.5% versus 34.9%) and obese (90.9% vs 19.4%), and were less likely to have DKA (7.8% vs 34.9%) and diabetes autoantibodies (4.6% vs 94.5%). Children with T2D also had significantly lower glucose and hemoglobin A1c, and lower C-peptide levels (all comparisons, p<0.0001).

Results (II)

In multivariable analysis, elevated C-peptide, older age, obesity, racial/ethnic minority, lower hemoglobin A1c, absence of DKA and negative diabetes autoantibodies were independently associated with T2D (all, p<0.03) while glucose and sex were not (model p<0.0001). However, as illustrated in the Figure, none of the characteristics were exclusive of either type of diabetes.



References

- (1) Mayer-Davis EJ, et al. N Engl J Med 2017; 376:1419-1429.
- (2) American Diabetes Association. Diabetes Care 2020;43:S14-S31.
- (3) Siller AF, et al. Pediatr Diabetes 2020 June 19 (online ahead of print)

Conclusions

There are clinical characteristics that are typical of either T1D or T2D. However, the overlap between the two diabetes types poses challenges for the classification of diabetes at the time of the diagnosis. Diagnosis of diabetes type at onset may require consideration of additional characteristics.