

Prevalence of acute metabolic complications in children with type I diabetes admitted to the children hospital in Qazvin, Iran (2005-2014)

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Abstract

Background: Type 1 diabetes (T1D) is one of the most common chronic diseases in childhood and adolescence. Diabetic ketoacidosis (DKA) and severe hypoglycemia are complications of T1D and are associated with significant morbidity and mortality.

Objective and hypotheses: The aim of this study was to determine the prevalence of acute metabolic complications in children with T1D admitted to the children hospital in Qazvin during 2005-2014.

Methods: In this cross sectional study, data were collected from health profiles of 228 patients that were hospitalized with acute complications of T1D during 2005-2014. The measurement tool was a datasheet including demographics, signs and symptoms of T1D, characteristics at the onset of disease, and characteristics during the hospitalization period. Data were analyzed using descriptive statistics.

Results: At Of 228 patients, 70.2% were female. The mean age at onset of disease was 7 years and 1 month. The incidence of diabetes was increased from four cases per year in 2005 to 21 cases per year in 2014. The onset of T1D was diagnosed by DKA and hyperglycemia in 94.7% and 5.3% of patients, respectively. 0.9%, 28%, and 71.1% of the new cases of T1D had mild, moderate, and severe DKA, respectively. Seven percent of patients were <2 years old, 20% were 2-5 years old, 22.6% were 5-8 years old, and 50.4% were ≥8 years old. The peak incidence was found to be in autumn. Of 228 patients, 50% had an infection. Mean blood glucose was 513.28±159.65 mg/dL and mean body mass index was 17.03 kg/m².

Conclusion: A greater incidence of diabetes in females is because of their risk factors for autoimmune diseases. The high incidence of DKA at the onset of disease in the present study compared to the previous studies indicates the delay in diagnosis of T1D.

Objectives

Type 1 diabetes (T1D) is one of the most common chronic diseases in childhood and adolescence. Diabetic ketoacidosis (DKA) and severe hypoglycemia are complications of T1D and are associated with significant morbidity and mortality. The aim of this study was to determine the prevalence of acute metabolic complications in children with T1D admitted to the children hospital in Qazvin during 2005-2014.

Methods

In this cross sectional study, data were collected from health profiles of 228 patients that were hospitalized with acute complications of T1D during 2005-2014. DKA was defined as blood glucose ≥ 250 mg/dl, arterial PH < 7.3, serum bicarbonate (HCO₃) > 15 meq/L, and positive urine ketones. The measurement tool was a datasheet including demographics, signs and symptoms of T1D, characteristics at the onset of disease, and characteristics during the hospitalization period. Data were analyzed using descriptive statistics.

Results

At Of 228 patients, 70.2% were female. The mean age at onset of disease was 7 years and 1 month. The incidence of diabetes was increased from four cases per year in 2005 to 21 cases per year in 2014. The onset of T1D was diagnosed by DKA and hyperglycemia in 94.7% and 5.3% of patients, respectively. 0.9%, 28%, and 71.1% of the new cases of T1D had mild, moderate, and severe DKA, respectively.

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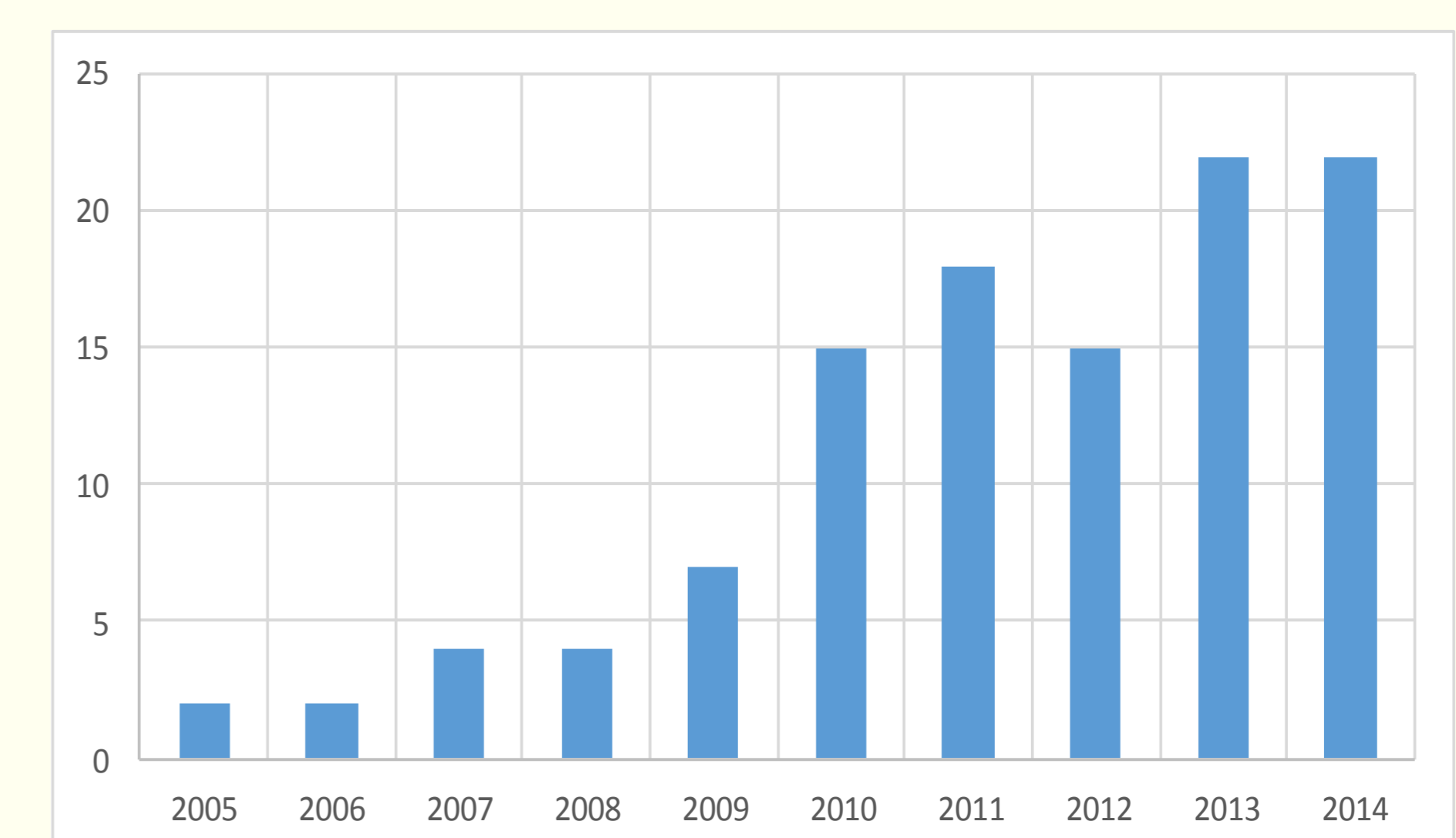


Figure 1. Frequency of complications in each year

Conclusions

A greater incidence of diabetes in females is because of their risk factors for autoimmune diseases. The high incidence of DKA at the onset of disease in the present study compared to the previous studies indicates the delay in diagnosis of T1D. Therefore, immediate diagnosis of the diabetes in a child and initiation of treatment can reduce the likelihood of DKA.

References

1. McGill DE, Levitsky LL. Management of Hypoglycemia in Children and Adolescents with Type 1 Diabetes Mellitus. *Curr Diab Rep.* 2016 Sep;16(9):88.
2. Choudhary A. Sick Day Management in Children and Adolescents with Type 1 Diabetes. *J Ark Med Soc.* 2016 Jun;112(14):284-6.
3. Jefferies CA, Nakhla M, Derraik JG, Gunn AJ, Daneman D, Cutfield WS. Preventing Diabetic Ketoacidosis. *Pediatr Clin North Am.* 2015 Aug;62(4):857-71.

