Why It Is Important To Know The Diabetes Type?

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Introduction

The distinction between type 1 and type 2 diabetes mellitus should be straight forward, based on age, body habitus, and type of presentation. A specific diagnosis is important since treatments, associated abnormalities, and outcomes differ. Unfortunately, the distinction is not always that simple. We present a case of a patient with features of both types.

Case Report

A 57-year-old obese female patient presented with polyglandular failure manifested by early ovarian failure, growth hormone deficiency, autoimmune diabetes since age 18, and alopecia totalis. Her Body Mass Index was 45. She manifested features of type 1 and type 2 diabetes.

Table 1. Features of diabetes observed in the patient.

Type 1 features	Type 2 features
Positive Anti-Glutamic Acid Decarboxylase (GAD) 65 antibodies	Persistent C-peptide for 38 years
Diabetic ketoacidosis (several times)	Hypertension
Polyglandular autoimmune disease	Dyslipidemia
Intolerance to oral hypoglycemic	Obesity

Discussion

Characteristics of the two diabetes entities can overlap as demonstrated by our patient. Age is not as helpful anymore, since 10 percent of elderly diabetic patients have evidence of an autoimmune process[1]; conversely the incidence of type 2 diabetes accounts for 30% of new adolescent diagnoses.[2] Presentation can be misleading. Diabetic ketoacidosis, the hallmark of type 1 diabetes, also can be the presenting symptom in patients with type 2 diabetes.[3] Obesity is present in over 90% of adolescents and the majority of adults with type 2 diabetes, whereas only 25% of patients with type 1 diabetes are overweight.[4] Approximately 30% of patients with type 2 diabetes have hypertension at presentation,[5] but it is rare at presentation in patients with type 1 diabetes.

C-peptide concentrations are usually high in patients with type 2 diabetes; hyperglycemia can cause transient insulin deficiency ("glucose toxicity") and a low initial plasma insulin level. In patients with type 1 diabetes, the decline in insulin level is steady over time.[6] Our patient maintained unexplainable normal to high C-peptide levels 38 years after diagnosis of type 1 diabetes. No sufficient data were found in the literature that explained the persistence of insulin secretion for such a long period.

Antibodies are present in 75 to 90% of patients with type 1 diabetes at presentation.[7] Adults who are thought to have type 2 diabetes and who have positive antibody tests eventually become insulin-dependent

and are considered to have latent autoimmune diabetes.[8]

In the absence of reliable diagnostic markers greater emphasis must be placed on the findings in the individual patient. This case demonstrated some type 2 features in a patient with type 1 diabetes. In daily practice, diagnoses often are generalized. Accurate diagnosis is important because the treatment and complications of type 1 and type 2 diabetes are distinct. Unfortunately, some cases of diabetes clearly cannot fit under a specific diagnosis.

The ultimate goal of treatment for type 2 diabetes is correction of the underlying insulin resistance through weight reduction, exercise, and medications. Patients with type 1 disease are at risk for other autoimmune disorders, such as thyroid, celiac, and Addison's disease. Whereas, patients with type 2 disease are at risk for hypertension, dyslipidemias, and macro-vascular disease. The genetic implications for other family members also differ for the two disorders.

Conclusion

Proper diagnosis of type 1 and type 2 diabetes mellitus is crucial to the treatment that an affected patient is likely to receive. Type 1 and type 2 diabetes are two different entities although they may overlap. Some patients manifest features of both types at the same time. In the absence of specific markers between the two types, further evaluation with C-peptide levels and auto immune markers are appropriate to evaluate many adults with diabetes mellitus.

References

[1] Wroblewski M, Gottsater A, Lindgarde F, Fernlund P, Sundkvist G. Gender, autoantibodies, and obesity in newly diagnosed diabetic patients aged 40-75 years. Diabetes Care 1998; 21:250-255.

[2] Pinhas-Hamiel O, Dolan LM, Daniels SR, Standiford D, Khoury PR, Zeitler P. Increasing incidence of non-insulin-dependent diabetes mellitus among adolescents. J Pediatr 1996; 128:608-615.

[3] Umpierrez GE, Casals MM, Gebhart SP, Mixon PS, Clark WS, Phillips LS. Diabetic ketoacidosis in obese African-Americans. Diabetes 1995; 44:790-795.

[4] Scott CR, Smith JM, Cradock MM, Pihoker C. Characteristics of youth-onset noninsulin-dependent diabetes mellitus and insulin-dependent diabetes mellitus at diagnosis. Pediatrics 1997; 100:84-91.

[5] UK Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. BMJ 1998; 317:703-713.

[6] Snorgaard O, Lassen LH, Binder C. Homogeneity in pattern of decline of beta-cell function in IDDM: Prospective study of 204 consecutive cases followed for 7.4 yr. Diabetes Care 1992; 15:1009-1013.

[7] Wiest-Ladenburger U, Hartmann R, Hartmann U, Berling K, Böhm BO, Richter W. Combined analysis and single-step detection of GAD65 and IA2 autoantibodies in IDDM can replace the histochemical islet cell antibody test. Diabetes 1997; 46:565-571.

[8] Rowley MJ, Mackay IR, Chen QY, Knowles WJ, Zimmet PZ. Antibodies to glutamic acid decarboxylase discriminate major types of diabetes mellitus. Diabetes 1992; 41:548-551.

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