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CHALLENGES IN MANAGING DE NOVO DIABETES IN ADULTS: A CASE REPORT OF A 47 YEAR OLD MALE

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Abstract

Differentiating between type 1 and type 2 diabetes in adults can be challenging, particularly in cases that do not fit the classic presentation. Misclassification occurs in a significant proportion of patients, leading to delays in appropriate treatment. This case report describes a 47-year-old male with newly diagnosed diabetes, initially treated as type 2 diabetes but exhibiting progressive hyperglycemia, weight loss, and lack of response to oral medications. Further diagnostic testing, including C-peptide measurement and autoantibody screening, was crucial in refining the diagnosis. While the absence of anti-GAD and ICA antibodies ruled out autoimmune type 1 diabetes, the patient's clinical presentation suggested an atypical form of diabetes requiring insulin therapy. This case underscores the importance of early differential diagnosis and highlights the role of continuous glucose monitoring, C-peptide testing, and antibody screening in guiding treatment decisions. A tailored approach to diabetes classification is essential to ensure timely initiation of appropriate therapy and prevent complications.

Keywords: diabetes mellitus type 1, diabetes mellitus type 2, C-peptide

Introduction

Differentiating between type 1 and type 2 diabetes in the early stages of the disease can be a diagnostic challenge, particularly in adult patients. While type 1 diabetes is an autoimmune disorder that leads to the complete destruction of pancreatic β -cells and absolute insulin deficiency, type 2 diabetes is characterized by insulin resistance and a gradual decline in pancreatic function [1-4]. However, in clinical practice, the symptoms of both types of diabetes can overlap, complicating the diagnostic process.

Classification is based primarily on clinical judgement, with younger slimmer patients tending to be classed as T1, and older, more obese patients diagnosed as T2 [5]. However, with obesity increasing in the population and the resulting increase in T2D in the young, this traditional distinction has become less clear. Misclassification of diabetes has been shown to occur in 7–15% of cases [6-8]. In adults with de novo diabetes, especially those without obesity, it is often difficult to determine whether the patient has type 1 diabetes with a slower progression (LADA - latent autoimmune diabetes in adults) or early-stage type 2 diabetes. Accurate diagnosis is crucial as it influences treatment choices - type 1 diabetes requires insulin therapy, while type 2 diabetes often responds initially to oral medications [3, 4, 9-11].

This report presents the case of a 47-year-old male with newly diagnosed diabetes, in whom initially there was difficulty in determining the type of diabetes, which had significant consequences for the treatment process. This case underscores the importance of differential diagnosis and the role of additional tests, such as autoantibody testing and C-peptide levels, in accurately determining the diagnosis.

Case Presentation

A 47-year-old male patient presented to the Emergency Department (ED) in early December 2024 with significant weakness, polyuria, polydipsia, and unintended weight loss of 7.5 kg over the past two months. Laboratory tests revealed hyperglycemia (258 mg/dL), ketonuria at 1+, and normal pH, electrolytes, and kidney function. The patient was not hospitalized, and after a consultation with an endocrinologist, treatment with metformin (850 mg once daily) and sitagliptin (100 mg once daily) was initiated.

Despite the prescribed oral medications, symptoms did not improve, and the patient continued to lose weight. By the end of January 2025, the patient was admitted to the internal medicine ward with persistent hyperglycemia and continued weight loss (a total of 10 kg over three months). Glucose measurements using a glucometer ranged from 373 mg/dL fasting to 500 mg/dL postprandially. The patient's height was 168 cm, and his current weight was 65 kg, resulting in a BMI of 23.03 kg/m².

The patient reported no chronic illnesses or drug allergies. Both of his parents had type 2 diabetes. Due to the ongoing hyperglycemia despite oral treatment and progressive weight loss, further diagnostic testing was warranted to differentiate the type of diabetes.

Diagnostic Workup

To determine the cause of the persistent hyperglycemia, additional laboratory tests were ordered, including C-peptide levels and autoimmune antibody testing: anti-GAD antibodies (gamma-glutamic acid decarboxylase), ICA (islet cell antibody).

The laboratory results showed a C-peptide level of 0.95 ng/ml, with postprandial values of 1.66 ng/ml after 1 hour and 2.22 ng/ml after 2 hours. Anti-GAD and ICA antibodies were negative, ruling out autoimmune type 1 diabetes (LADA). Hemoglobin A1c (HbA1c) was 11.6%, indicating poor glycemic control over the past several months.

After several days of initiating insulin therapy and continued monitoring of blood glucose levels, better glycemic control was achieved. In addition, diabetes education was provided, emphasizing glucose monitoring, insulin self-injection, and adherence to a healthy lifestyle. Furthermore, to optimize therapy, regular monitoring of HbA1c, blood pressure control, and statin therapy were recommended for cardiovascular protection.

Despite a normal BMI of 23.03 kg/m², the patient did not respond to oral medications (metformin, sitagliptin), raising suspicion that the diabetes may not follow the classic course of type 2 diabetes. The weight loss and lack of response to oral treatment, combined with preserved C-peptide levels, suggested the possibility of type 1 diabetes or LADA. These characteristics, along with high glucose levels, pointed to a potential autoimmune etiology for the disease.

Discussion

The case of this 47-year-old patient, who initially presented to the ED with symptoms suggestive of diabetes, presents a diagnostic challenge, particularly in light of the difficulty in clearly diagnosing the type of diabetes. Initially, the patient was diagnosed with type 2 diabetes, but the clinical course and lack of response to oral treatment prompted consideration of other causes, including type 1 diabetes or LADA (latent autoimmune diabetes in adults).

One key aspect in the diagnosis was the patient's thinness. A 47-year-old individual who presents with significant weight loss (7.5 kg over 2 months), especially with a normal body weight and no other chronic diseases, is atypical for type 2 diabetes [5]. Type 2 diabetes often occurs in individuals who are overweight or obese, and patients with this type typically respond to oral medications [5]. In this case, the patient showed no improvement despite taking metformin and sitagliptin, suggesting that the diagnosis of type 2 diabetes might have been premature. In type 1 diabetes, especially in adults, weight loss symptoms are common due to insulin deficiency and catabolism, which was consistent with the clinical presentation of this patient [12].

Diagnostic results such as the C-peptide level of 0.95 ng/ml (within the normal range) indicated preserved endogenous insulin production. Additionally, the increase in C-peptide levels after meals (1.66 ng/ml after 1 hour and 2.22 ng/ml after 2 hours) suggested a pancreatic response to food intake, indicating that the patient was not completely dependent on exogenous insulin. While these results did not exclude type 1 diabetes, they indicated that the patient retained some ability to produce insulin, which is typical in early-stage type 1 diabetes [12]. C-peptide is likely to be less discriminatory at diagnosis, as patients with T1D can still produce their own insulin in the 'honey moon' period, so it would be important to examine predictors of insulin deficiency after this time. Antibodies may represent a useful test at diagnosis, where C-peptide is of limited value due to the 'honey moon period', where patients with T1D are still able to produce significant amounts of their own insulin for a short period of time [13].

An important result was the negative anti-GAD and ICA antibodies, which ruled out autoimmune type 1 diabetes (LADA). Anti-GAD and ICA antibodies are commonly present in autoimmune type 1 diabetes, but it should be noted that their presence can vary depending on the stage of the disease, and their absence does not exclude the diagnosis of LADA [14]. Therefore, although the anti-GAD and ICA test were negative, it is not possible to completely exclude LADA in this case.

The high hemoglobin A1c (HbA1c) of 11.6% indicated chronic, uncontrolled hyperglycemia, which is characteristic of both type 1 and type 2 diabetes in later stages. Such a high value indicates poor metabolic control, which is common in type 1 diabetes, especially in the early stages of the disease when patients may not recognize the need for more intensive treatment.

The lack of response to oral treatment, especially with symptoms such as polydipsia, polyuria, and continued weight loss, prompted consideration of more advanced treatment, such as insulin therapy, which is the standard for type 1 diabetes [1-4]. Despite preserved insulin production, the lack of response to oral treatment suggested that the patient needed external insulin support, which is typical for type 1 diabetes [3,5].

An abdominal ultrasound was also performed to rule out pancreatic diseases that could cause pancreatic tissue damage, such as chronic pancreatitis or pancreatic cancer, which may lead to diabetes symptoms [15]. The examination report indicated no abnormalities: the pancreas was fully visible, of normal size, and had a homogeneous echotexture.

In conclusion, the patient's thinness, lack of response to oral treatment, and persistent hyperglycemia, despite endogenous insulin production, suggested a diagnosis of type 1 diabetes or LADA. Although diagnostic results such as the negative anti-GAD and ICA antibodies ruled out autoimmune type 1 diabetes, the lack of response to treatment and clinical symptoms still warranted further monitoring of the patient for the development of full-blown type 1 diabetes. This case highlights the importance of careful observation of patients with atypical diabetes presentations, particularly in the context of diagnostic challenges in autoimmune cases and early-stage type 1 diabetes in adults.

Conclusion

The findings from this case highlight the importance of differential diagnosis in adult diabetes, especially in cases that do not fit the classic picture of type 2 diabetes. Increased vigilance towards type 1 diabetes or LADA, even in the absence of anti-GAD antibodies, can help facilitate earlier diagnosis and therapy adjustments. Therefore, early monitoring of patients with atypical disease progression and tailoring treatment to the individual patient's needs is crucial to prevent complications and improve the quality of life for patients.

In cases of diagnostic uncertainty, early measurement of C-peptide and diabetes-related autoantibodies is crucial for accurate classification. Utilizing continuous glucose monitoring systems enables the early detection of disease progression and inadequate glycemic control. Furthermore, the lack of response to oral therapy in newly diagnosed diabetes should prompt further diagnostic evaluation and an early transition to insulin therapy to ensure optimal management and prevent complications.

Disclosure

Author's Contribution:

Conceptualization, DM, MB and AK; methodology, BJ; software, MF; check, MM, AK and DM; formal analysis, BJ; investigation, DM, AK; resources, DM, MB; data curation, DM; writing - rough preparation, DM, MF; writing - review and editing, DM, MM; supervision, DM; project administration, DM;

All authors have read and agreed with the published version of the manuscript.

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