Tepecik Eğit. ve Araşt. Hast. Dergisi 2021;31(1):130-2
doi:10.5222/terh.2021.94840

Is There any Other Disease Under the Newly Diagnosed Diabetes that is Difficult to Control?

Kontrol Edilmesi Zor Yeni Tanı Diyabette Altta Yatan Başka Bir Hastalık Olabilir Mi?

Olgu Sunumu
Case Report

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ABSTRACT

High levels of growth hormone and insulin-like growth factor 1 contribute to tissue proliferation and hypertrophy in patients with acromegaly mostly due to growth hormone-secreting pituitary adenoma. Some phenotypic features of acromegaly that make us to consider in the differential diagnosis are excessive growth of the hands and feet and coarsening facial features. Growth hormone also induces lipolytic activities and insulin resistance, so patients with acromegaly often present with impaired glucose tolerance and type 2 diabetes mellitus. We wanted to share a case with treatment-resistant hyperglycemia which is the cause of presentation of acromegaly.

Keywords: *Acromegaly, growth hormone, diabetes mellitus*

ÖZ

Yüksek seviyedeki büyüme hormonu ve insülin benzeri büyüme faktörü 1, çoğunlukla büyüme hormonu salgılayan hipofiz adenomu nedeniyle akromegali hastalarında doku proliferasyonuna ve hipertrofiye katkıda bulunur. Ayırıcı tanıda düşünmemizi gerektiren akromegalinin bazı fenotipik özellikleri ellerin ve ayakların aşırı büyümesi ve yüzde kabalaşmadır. Büyüme hormonu ayrıca lipolitik etkilere ve insülin direncine neden olur, bu nedenle akromegali hastaları sıklıkla bozulmuş glukoz toleransı ve tip 2 diabetes mellitus ile ortaya çıkar. Akromegalinin ortaya çıkmasına neden olan tedaviye dirençli hiperglisemili bir vakayı paylaşmak istedik.

Anahtar kelimeler: *Akromegali, büyüme hormonu, diabetes mellitus*

INTRODUCTION

Acromegaly is a relatively rare clinical entity that develops secondary to increased levels of hepatic insulin-like growth factor 1 (IGF-1) due to the uncontrolled release of growth hormone (GH). The most common cause (95%) is isolated pituitary tumors that secrete growth hormone. The average age at diagnosis is 40-45 years. Excessive growth hormone and IGF-1 levels may present with many somatic effects such as growth in skin, connective tissue, cartilage, bone, visceral organs, or less frequently with metabolic effects such as insulin resistance, secondary diabetes and lipolysis. In patients with acromegaly, increased prevalence of impaired glucose intolerance and diabetes are observed. We wanted to present our case of acromegaly presenting with overt diabetes.

CASE

A 44-year-old man with no history of chronic disease was admitted to the outpatient clinic with complaints of polyuria, polydipsia and dry mouth. The patient's blood pressure at the outpatient clinic was 140/95 mm Hg, pulse:

Received/Geliş: 14.05.2019
Accepted/Kabul: 14.01.2020
Published Online: 29.04.2021

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Cite as: Kaypak MA, Patır DÇ, Özalp FR, Akar H. Is there any other disease under the newly diagnosed diabetes that is difficult to control?. Tepecik Eğit. ve Araşt. Hast. Dergisi. 2021;31(1):130-2.

84/min: body temperature 37.2°C; and body mass index was 28 kg/m^2. Laboratory tests at the outpatient clinic revealed fasting blood glucose: 300 mg/dL and HbA1c: 6.7%. The patient, was hospitalized for newly diagnosed diabetes and arterial blood gas analysis did not show any evidence of acidosis. Insulin infusion was started to correct the patient's glucose toxicity. The patient's insulin antibodies were negative. In addition to excessive sweating and headache, the patient had a history of increase in the size of his shoes and gloves In the detailed physical examination, mild growth in the frontal bone and lower jaw, slight growth in the acral region such as the hands, feet, and coarsening of the skin were noted. Based on current history and physical examination, the patient was thought to have secondary diabetes due to acromegaly. Her IGF-1 level was found to be 404 ng/ml. The level of IGF-1 was found to be high, and after oral glucose tolerance test (OGTT) performed following oral intake of 75 g glucose solution, GH level was measured. The GH level was not suppressed after 75 grams of OGTT. The patient's pituitary MRI revealed the presence of a 1.3 cm diameter macroadenoma. Eye examination was normal. thyroid Doppler ultrasonography, endoscopy and colonoscopy were planned to detect possible malignancies. Thyroid Doppler ultrasonography was normal. The patient refused endoscopy and colonoscopy. Echocardiography did not show any remarkable features excepting left ventricular diastolic dysfunction. The patient, who was eligible for surgery, underwent preoperative preparations and transsphenoidal pituitary surgery. During the postoperative period, it was observed that hyperglecemia was regulated with metformin. Blood pressure was under control with the diet. GH and IGF-1 levels of postoperative 12th week were increased. Control pituitary MRI revealed residual adenoma. The patient was started on ocreotide every 28 days. His metabolic status was stable, and his complaints of headache polyuria, polydipsia, dry mouth regressed. His blood pressure was under control. The patient was monitored by ocreotid therapy.

DISCUSSION

Untreated acromegaly is associated with cardiovascular mortality due to increased risk of cardiomegaly, hypertension, and type 2 diabetes [1,2]. Insulin resistance, impaired glucose tolerance, and type 2 diabetes are common in acromegaly, and underlying molecular mechanisms have been still investigated in detail [1,2]. Diabetes mellitus is a frequent complication of acromegaly with a prevalence of 12-37 percent [2]. Insulin resistance, hyperinsulinemia, and increased gluconeogenesis in combination create a favorable environment for the development of type 2 diabetes in acromegaly [3].

Insulin resistance in acromegaly occurs mainly in the liver, adipose tissue and muscles. GH may cause insulin resistance due to its effect on glucose metabolism and by decreasing autophosphorylation of insulin receptors. GH is a counter-regulatory hormone that antagonizes the hepatic and peripheral effects of insulin on glucose metabolism through the simultaneous increase in FFA flow and uptake [4]. Long-term exposure to GH and insulin-like growth factor-1 induce insulin resistance and increase glucose production in the liver. GH promotes the mobilization of free fatty acids that contribute to the reduction of insulin sensitivity [5]. Because of excessive secretion of GH, as well as its direct undesirable effects, GH mediates most of the phenotypic properties and metabolic effects, leading to excessive production of IGF-1 [6]. Although the symptoms and signs of acromegaly are diverse, the most common typical clinical symptoms are facial coarseness, soft tissue swelling, and acral enlargement [6]. Acromegalic patients may experience growth of the hands and feet due to soft tissue swelling, furrowing of forehead, pronounced protrusion of brows, ears and nose enlargement, thickening of the lips, skin wrinkles and nasolabial folds, mandibular prognathism causing dental malocclusion and increased interdental spacing [6]. Early diagnosis of acromegaly is quite difficult. Patients with acromegaly usually receive

diagnoses for their nasal septum problems, cardiomyopathy or sleep apnea so the diagnosis of primary acromegaly is overlooked [7].

In general, the diagnosis of acromegaly is made in advanced stages where treatment is relatively difficult. In their study, Reid et al. [8] tested whether the disease severity in acromegaly had changed or not from 1982 to 2006. They concluded that acromegaly is underdiagnosed because of the presence of marked acromegaly at the time of diagnosis in most patients. Acromegaly awareness should be increased through educational programs, which may lead to early diagnosis and better treatment outcomes. As in our case, the reason for the first presentation of acromegaly can rarely be in the form of overt diabetes. In our case, resistant hyperglycemia and diabetes were present. Patients with hyperglycemia should be evaluated in terms of detailed history and physical examination findings in terms of secondary diabetes, as glucose intolerance can be reduced by effective treatment of acromegaly and cardiovascular complications are reduced.

Conflict of Interest:
Informed Consent:

REFERENCES

1. Silha JV, Krsek M, Hana V et. al Perturbations in adiponectin, leptin and resistin levels in acromegaly: lack of correlation with insulin resistance. Clin Endocrinol (Oxf). 2003;58(6):736-42. [CrossRef]
2. Hannon AM, Thompson CJ, Sherlock M. Diabetes in Patients With Acromegaly. Curr Diab Rep. 2017;17(2):8. [CrossRef]
3. Claire Rochette, Thomas Graillon, Frederique Albarel, Isabelle Morange, Henry Dufour, Thierry Brue, Frederic Castinetti, Increased Risk of Persistent Glucose Disorders After Control of Acromegaly, Journal of the Endocrine Society. 2017;1(12):1531-9. [CrossRef]
4. Moller N, Jorgensen JO. Effects of growth hormone on glucose, lipid, and protein metabolism in human subjects. Endocrine Reviews. 2009;30(2):152-77. [CrossRef]
5. Mercado M, Ramírez-Rentería C. Metabolic Complications of Acromegaly. Front Horm Res. 2018;49:20-8. [CrossRef]
6. Vilar L, Vilar CF, Lyra R, Naves LA. Acromegaly: clinical features at diagnosis. Pituitary. 2017;20(1):22-32. [CrossRef]
7. Guo X, Meng T4, Huang J et. al 3D Facial Analysis in Acromegaly: Gender-Specific Features and ClinicalCorrelations. Front Endocrinol (Lausanne). 2018;9:722. [CrossRef]
8. Reid TJ, Post KD, Bruce JN et. al Features at diagnosis of 324 patients with acromegaly did not change from 1981 to 2006: acromegaly remains under-recognized and under-diagnosed. Clin Endocrinol. 2010;72:203-8. [CrossRef]