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CASE REPORT
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Hemifacial Spasm Associated with Severe Hyperglycemia in a Patient with New-Onset Type 2 Diabetes: A Case Report and Review of the Literature

A 65-year-old male was admitted due to intermittent involuntary movements of the left side of his face that started the night before. Twitching movements occurred multiple times per hour, and each episode lasted for less than one minute. The patient reported polyuria and polydipsia for three days preceding admission. In the emergency department laboratory tests revealed an elevated random glucose level of 23.9 mmol/L (3.9–5.8). The patient had no history of diabetes but was treated for hypertension, heart failure, and chronic obstructive pulmonary disease; he was obese [body mass index (BMI) = 36 kg/m^2] and smoked. A year before he underwent left-sided Bell's palsy. Neurological examination showed left-sided peripheral facial paresis and intermittent twitching movements of the left side of the face. There was no history of involuntary movements or seizures in the past, and the family history was unremarkable. Due to suspicion of focal seizures, intravenous diazepam was administered, but ineffectively.

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Video-electroencephalography (Suppl. File 1) excluded epileptic etiology of the movements. Tetany test was negative. Head magnetic resonance imaging (MRI) with contrast showed no clinically relevant abnormalities. The laboratory tests showed very high glycemia levels, glycated hemoglobin of 13.70% (4–6%), and severe dyslipidemia, with a total cholesterol level of 12.6 mmol/L (< 5.2), high-density lipoproteins (HDL) of 0.46 mmol/L (> 1.45), non-HDL of 12.14 mmol/L (< 1.8), and hypertriglyceridemia of 26.9 mmol/L (< 2.3).

The patient was diagnosed with new-onset diabetes (most probably type 2) and treated with insulin. Treatment with levetiracetam was also introduced. With normalization of glycemia the symptoms improved dramatically. The patient was ultimately diagnosed with hemifacial spasm, resulting from the past facial nerve injury and revealed by severe hyperglycemia. Levetiracetam was withdrawn. In the follow-up visits after discharge no involuntary movements of the face were observed.

Discussion

Hemifacial spasm (HFS) is the most prevalent movement disorder originating from the injury to the peripheral nervous system, caused by the irritation of the facial nerve. It presents as involuntary movements involving ipsilateral facial muscles. It can be idiopathic but may be caused by neurovascular compression or

Table 1. Summary of studies reporting cases of hyperglycemia-associated HFS

	Age, sex	Comorbidities	HFS onset	Additional symptoms	Head MRI	Disease course
Ghosh et al., 2021 [3]	31, M	History of pancreatitis 6 years before Chronic pancreatitis and type-3 diabetes diagnosed during hospitalization	3 months before admission, with exacerbation 12 days before admission	Abdominal pain, steatorrhea, involuntary weight loss	Normal	HFS disappeared after reaching normoglycemia
Ghosh et al., 2022 [4]	61, M	Type 2 diabetes diagnosed during hospitalization.	1 month before admission	Left upper limb chorea present for 36 hours before admission, polyuria, polydipsia, general malaise	Hyperintense lesion in the right striatum	Subtle and infrequent involuntary movements persisted, and right striatal lesion in MRI only partially resolved in a 6-month follow-up
Tesfay and Stenør, 2021 [5]	71, M	Suspicion of diabetes in previous years — not confirmed then Diabetes mellitus diagnosed during hospitalization	14 days before admission	Short-lasting involuntary movements of the right hand 14 days before admission	Hyperintense lesion in the left putamen	HFS disappeared after reaching normoglycemia, and the putamen lesion completely resolved in a control MRI performed after 18 months
Bandyopadhyay and Dutta, 2005 [6]	17, M	Type-1 diabetes diagnosed 3 months before admission. Patient stopped taking insulin	n/d	Dehydration, tachypnoea	Normal	HFS disappeared after reaching normoglycemia
	29, F	Type 1 diabetes diagnosed 10 years before, patient took medications irregularly	n/d	Dehydration, altered mental status	Normal	HFS disappeared after reaching normoglycemia
Chakrabarti, 2015 [7]	34, M	Type 1 diabetes diagnosed during hospitalization	12 days before admission	Polyuria, polydipsia, involuntary weight loss	Normal	HFS disappeared after reaching normoglycemia
Chen et al., 2021 [8]	46, M	Diabetes diagnosed during hospitalization	9 days before admission	none	Vertebrobasilar dolichoectasia with branching vessels adjacent to the left facial nerve	HFS disappeared after reaching normoglycemia

HFS — hemifacial spasm; MRI — magnetic resonance imaging

numerous secondary causes, including Bell's palsy, other facial nerve injuries, or brainstem lesions [1].

Hyperglycemia can cause acute-onset movement disorders, most commonly hemichorea-hemiballismus. In one case series hyperglycemia-induced HFS was diagnosed in 5.1% of patients with acute-onset movement disorders attributed to hyperglycemia [2]. The potential mechanisms of HFS development in diabetic patients include a direct neurotoxic effect of hyperglycemia and its impact on facial nerve vasa nervorum [3].

So far, seven cases of hyperglycemia-associated HFS have been reported [3–8] (Tab. 1). Most reported patients (87%) were male, although HFS is generally more prevalent in women [1]. In five patients (71%) diabetes was not diagnosed before the involuntary movements' onset, and two others were previously

diagnosed with type 1 diabetes [6]. HFS occurred with both ketotic [6] and non-ketotic [4, 5, 7, 8] hyperglycemia. A potential structural cause of facial nerve damage was found in one patient [8], in two others hyperintense basal ganglia lesions were found [4, 5], and in the remainder head MRI was normal. In patients with basal ganglia lesions involuntary movements of the limbs were also present [4, 5]. HFS disappeared after reaching normoglycemia in all patients except one, in whom hyperintense basal ganglia lesion in MRI persisted [4]. Most reported patients are of Asian origin, which is consistent with HFS being generally more prevalent in the Asian population [9].

Differential diagnosis of HFS includes other involuntary movements (tics, dystonia, myoclonus, hemimasticatory spasm) and psychogenic disorders [1]. Video EEG excludes epileptic origin of the movements [10]. In patients presenting with acute-onset movement disorders, glycemia measurements should be routinely performed.

Article information

Supplementary material

The Supplementary material for this article can be found online at https://journals.viamedica.pl/clinical_diabetology/article/view/104538.

Ethics statement

The patient gave informed written consent for the publication of the case report and video documentation.

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Conflict of interest

The authors declare no conflict of interest.

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