



Diplopia as the Presenting Symptom of Type 1 Diabetes

Charlotte G. Krol, Frederikus A. Klok, and Eelco J.P. de Koning

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Neuropathy is a common complication of diabetes, in which cranial nerve palsies are rare and associated with long-standing poorly controlled type 2 diabetes. We report a case of a young patient with oculomotor nerve palsy as the presenting symptom of type 1 diabetes.

A 36-year-old previously healthy Sudanese man was referred to our emergency department because of progressive diplopia of his right eye for 7 days. At the emergency department, he also reported weight loss, fatigue, excessive thirst, and polyuria in the previous few weeks. His family history revealed type 2 diabetes in his father. On physical examination, there was ptosis and reduced abduction of his right eye. Pupil function was normal. His BMI was 23 kg/m². Laboratory examination showed a random glucose level of 23 mmol/L and a C-peptide level of 0.26 nmol/L. GAD antibodies, insulin antibodies, and antibodies against insulinoma-associated antigen-2 were not detectable. C-reactive protein level, leukocyte count, and creatinine level were within normal limits, and his pH was 7.40. The urine dipstick tested positive for ketones, but negative for albuminuria. The results of funduscopy, chest X-ray, and magnetic resonance angiography of the brain were normal. Acute oculomotor nerve palsy due to diabetes

was the diagnosis. Given his normal BMI and rapidly progressive symptoms, type 1 diabetes was considered the most likely diagnosis. Therefore, and because cranial mononeuropathy requires rapid correction of hyperglycemia, insulin therapy was initiated immediately. Normoglycemia was achieved with a basal-bolus regimen and a daily dose of 0.67 units/kg within a few weeks. Four months after the initial diagnosis, the patient's oculomotor nerve palsy had improved dramatically, with almost complete resolution of symptoms.

Cranial mononeuropathies are rare and most frequently occur in older individuals with long-standing, poorly controlled type 2 diabetes with vascular and neuropathic complications (1–3). Symptoms of oculomotor nerve palsy consist of an abrupt onset of debilitating severe diplopia and a decrease of visual acuity. Physical examination shows paralysis of adduction, elevation, depression, and ptosis. Pupil abnormalities can occur, and heavy ocular pain is reported. Diabetic oculomotor nerve palsies usually occur without other cranial nerve palsies (4). The nerve injury is thought to be caused by either nerve ischemia or infarction of the nuclei in the mesencephalon. In patients with diabetic oculomotor nerve palsy, infarction occurs in the core of the

nerve, sparing the superomedial-concentrated pupillomotor fibers and thereby pupil function, in contrast to palsies due to other diagnoses (4,5). Differential diagnoses include infectious diseases, aneurysms, inflammatory disorders, tumors, trauma, and surgery (4). Diabetic oculomotor nerve palsies typically recover over weeks to months without sequelae. Management is supportive, including optimal glycemic control as well as minimization of other risk factors for ischemia, including control of blood pressure and lipid levels (2).

In conclusion, isolated oculomotor nerve palsy may be the presenting symptom in a patient with new-onset type 1 diabetes. Clinicians should consider a diagnosis of diabetes in patients presenting with otherwise unexplained, isolated cerebral mononeuropathy.

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Department of Endocrinology and Metabolism, Leiden University Medical Centre, the Netherlands

Corresponding author: Charlotte G. Krol, c.g.krol@lumc.nl.

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References

1. Watanabe K, Hagura R, Akanuma Y, et al. Characteristics of cranial nerve palsies in diabetic patients. *Diabetes Res Clin Pract* 1990;10:19–27
2. Greco D, Gambina F, Maggio F. Ophthalmoplegia in diabetes mellitus: a retrospective study. *Acta Diabetol* 2009;46:23–26
3. Saleh T, Badshah A, Nicola M, Afzal K, Dimayuga S. Partial cranial nerve III palsy as a manifestation of undiagnosed diabetes. *South Med J* 2010;103:389–390
4. Keane JR. Third nerve palsy: analysis of 1400 personally-examined inpatients. *Can J Neurol Sci* 2010;37:662–670
5. Brown MR, Dyck PJ, McClearn GE, Sima AA, Powell HC, Porte D Jr. Central and peripheral nervous system complications. *Diabetes* 1982;31(Suppl. 1):65–70