"Eye of the Tiger" in a Non-Responsive Neuropsychiatric Patient: A Case Report

Milad Hosseinialhashemi[1], Babak Daneshfard[2,3,4], and Atefe Hashemi[1]

[1] *Student's Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran*

[2] *Research Center for Traditional Medicine and History of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran*

[3] *Essence of Parsiyan Wisdom Institute, Phytopharmaceutical Technology and Traditional Medicine Incubator, Shiraz University of Medical Sciences, Shiraz, Iran*

[4] *Department of Persian Medicine, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran*

Received: 07 Nov. 2016; Accepted: 16 Apr. 2017

Abstract- Hallervorden-Spatz syndrome is a rare neurodegenerative disorder with hereditary properties. It usually occurs in young adolescents with extrapyramidal symptoms besides disturbed mental function. In this study, we present a 23-year-old neuropsychiatric patient who primarily misdiagnosed to have conversion disorder. She had 5-year history of progressive dysarthria and generalized abnormal movements. After detecting the pathognomonic sign of "eye of the tiger" diagnosis was confirmed. The patient was discharged. She had satisfactory condition in her follow-up. Such a rare syndrome should be considered in patients with similar presentation, and upon the diagnosis, PKAN2 gene study should be done to detect possible new mutations.

Acta Med Iran 2018;56(1):71-73.

Keywords: Pantothenate kinase-associated neurodegeneration; Hallervorden-Spatz syndrome; neurodegenerative diseases; Magnetic resonance imaging; Case report

Introduction

Neurodegeneration with Brain Iron Accumulation Type 1" (NBIA-1) or "Pantothenate Kinase-Associated Neurodegeneration" (PKAN) formerly known as Hallervorden-Spatz syndrome is a severe hereditary neurodegenerative disorder firstly described in 1922 (1-3). The gradual progressive course of the disease usually occurs in young adolescents presenting with mental deterioration and extrapyramidal symptoms (including dysarthria, dystonia, choreoathetosis, and rigidity). Moreover, other findings such as cerebellar ataxia, optic nerve atrophy, convulsion, amyotrophy, and retinitis pigmentosa may be seen (4).

This hereditary disease has an autosomal recessive pattern mainly related to mutation in Pantothenate Kinase 2 (PANK2) gene (5). This mutation would result in iron accumulation in neural tissue, gliosis, and axonal spheroid formation in central nervous system especially in globus pallidus and substantia nigra (6).

MRI T2-weighted brain imaging of these patients demonstrates a particular sign which is called "eye of the tiger." This pathognomonic finding occurs due to central hyperintensity and peripheral hypointensity in the brainstem (7). Although laboratory data are not helpful in diagnosing the disease (8), other paraclinical tests, i.e., genetic studies besides neurological, psychiatric, and ophthalmologic evaluations should be considered to confirm the diagnosis.

Unfortunately, no specific treatment approach has been introduced for this syndrome till now. Hence, the current practice is based on managing the patient's symptoms.

Case Report

A 23-year-old woman was admitted to Faghihi hospital, affiliated with Shiraz University of Medical Sciences (SUMS), following a 5-year history of progressive dysarthria and generalized abnormal movements. Her symptoms had begun with dystonia and choreoathetosis since she was 17. Her disease then progressed with progressive slurred speech, dysarthria, and depression. The patient's past medical and drug

Corresponding Author: B. Daneshfard
Department of Persian Medicine, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
Tel: +98 71 32345145, Fax+98 71 32345145, E-mail address: babakdaneshfard@gmail.com

history was unremarkable except for hepatitis A in childhood. Her 22-year-old sister had similar clinical presentations since the age of 16. Other family members were almost healthy.

At first, her disease was misdiagnosed as a conversion disorder, and therefore a tricyclic acid antidepressant drug was prescribed; however, her condition deteriorated over the time.

In her neurological examinations, the patient was alert, appropriately responding to the questions, and oriented to time, place, and person (TPP oriented). Cranial nerves examination showed no abnormality. In addition, sensory system and muscle powers were satisfactory. However, deep tendon reflexes were brisker than average (hyperreflexia) and cogwheel rigidity was noted. Cerebellar function tests (i.e., tandem gate, finger-to-nose, and fine finger movements) were also interrupted. Other physical examinations including HEENT (head, eyes, ears, nose, and throat), neck, chest, cardiovascular, abdomen, and extremities were unremarkable.

Her laboratory tests including complete blood count and differentials, thyroid function tests, kidney and liver function tests, and peripheral blood smear were normal. Also, urine and serum tests for Wilson's disease and viral hepatitis were negative. Finally, T2-weighted brain MRI showed bilateral symmetrical hypointensity in globus pallidus with central hyperintensity, the so-called eye-of-the-tiger sign (Figure 1).

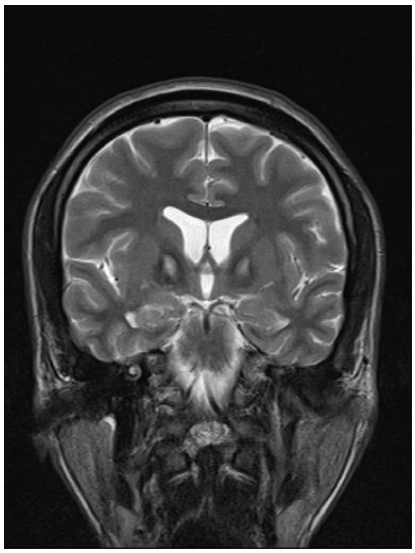

Figure 1. "Eye of the tiger" sign in T2-weighted brain MRI

Based on this pathognomonic finding, the disease was diagnosed with pantothenate kinase-associated neurodegeneration (PKAN). Consequently, she was treated with Levodopa and her symptoms significantly improved after 24 hours. The patient became able to walk with less difficulty while her dystonia and choreoathetosis reduced remarkably. The patient was discharged with Levodopa and Trihexyphenidyl. In follow-up, her symptoms resolved remarkably.

Discussion

In this case report, we presented a patient who was suffering from abnormal movements, dystonia, slurred speech, and depression. As a neuropsychiatric patient, she was previously misdiagnosed to have conversion disorder regarding her mood changes. In fact, her positive family history for similar presentations and MRI findings were somehow neglected to be related to such a rare genetic disease.

As a diagnostic challenge, PKAN has some differential diagnoses including Wilson's disease, hepatitis, drug toxicity, and Huntington's disease (9). A precise history taking to find out any positive family history besides considering clinical presentations could raise the clinical suspicion for this hereditary disease.

Although the disease is not common, it should be considered as a differential diagnosis in patients with similar sign and symptoms. Hence, brain MRI with and without gadolinium should be planned in these cases. In addition, further genetic studies would confirm the diagnosis and provide evidence for any new mutation.

References

1. Haraguchi T, Terada S, Ishizu H, Yokota O, Yoshida H, Takeda N, et al. Coexistence of TDP-43 and tau pathology in neurodegeneration with brain iron accumulation type 1 (NBIA-1, formerly Hallervorden-Spatz syndrome). Neuropathology 2011;31:531-9.
2. Hayflick SJ, Westaway SK, Levinson B, Zhou B, Johnson MA, Ching KH, et al. Genetic, clinical, and radiographic delineation of Hallervorden–Spatz syndrome. N Engl J Med 2003;348:33-40.
3. Craenenbroeck AV, Gebruers M, Martin JJ, Cras P. Hallervorden-Spatz disease: Historical case presentation in the spotlight of nosological evolution. Mov Disord 2010;25:2486-92.
4. Molinuevo JL, Martí MJ, Blesa R, Tolosa E. Pure akinesia: An unusual phenotype of Hallervorden- Spatz syndrome. Mov Disord 2003;18:1351-3.
5. Synofzik M, Asmus F, Reimold M, Schöls L, Berg D. Sustained dopaminergic response of parkinsonism and depression in PoLG-associated parkinsonism. Mov Disord

2010;25:243-5.

6. Neumann M, Adler S, Schlüter O, Kremmer E, Benecke R, Kretzschmar HA. α-Synuclein accumulation in a case of neurodegeneration with brain iron accumulation type 1 (NBIA-1, formerly Hallervorden-Spatz syndrome) with widespread cortical and brainstem-type Lewy bodies. Acta Neuropathologica 2000;100:568-74.
7. Hayflick SJ. Unraveling the Hallervorden-Spatz syndrome: pantothenate kinase–associated neurodegeneration is the name. Curr Opin Pediatr 2003;15:572-7.
8. Vasconcelos O, Harter D, Duffy C, McDonough B, Seidman J, Seidman C, et al. Adult Hallervorden–Spatz syndrome simulating amyotrophic lateral sclerosis. Muscle Nerve 2003;28:118-22.
9. Grimes D, Lang A, Bergeron C. Late adult onset chorea with typical pathology of Hallervorden-Spatz syndrome. J Neurol Psychiatr 2000;69:392-5.