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A Rare Case of Familial Hemiplegic Migraine with Reversible Motor Weakness and Aphasia

Güç Kaybı ve Afazi ile Seyreden Nadir Bir Ailevi Hemiplejik Migren Vakası

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Abstract

A case presenting with unilateral motor weakness, speech disturbance, and migraine-like headache, accompanied by normal cranial imaging, diagnosed as familial hemiplegic migraine (FHM), is presented to emphasize its rarity and the importance of differential diagnosis.

A 44-year-old male patient presented with unilateral weakness in the right arm and leg, lasting approximately one day, along with speech impairment characterized by motor aphasia. The patient reported migraine-like throbbing headaches accompanied by photophobia and phonophobia, with episodes recurring every 3-5 years and triggered by stress. His medical history included thyroid surgery and smoking (20 pack-years), and a family history of similar episodes in the mother and uncle. Neurological examination revealed motor aphasia and right extremity muscle strength of 4/5, but no other pathological findings. Laboratory results, EEG, and cranial magnetic resonance imaging (MRI) were normal. During hospitalization, enoxaparin and lamotrigine were initiated due to prolonged symptoms. The symptoms gradually improved within 2-3 days, with complete resolution observed by the third day.

In patients presenting with migraine-like attacks accompanied by unilateral motor weakness and speech disturbances, familial hemiplegic migraine should be considered, especially when imaging and laboratory findings are unremarkable. Recognition of this rare diagnosis is crucial to avoid unnecessary investigations and treatments.

Keywords: Case Report, Familial Hemiplegic Migraine, Migraine.

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Öz

Tek taraflı motor zayıflık, konuşma bozukluğu ve migren benzeri baş ağrısı ile birlikte normal kraniyal görüntüleme bulgularının eşlik ettiği ve ailevi hemiplejik migren (FHM) olarak tanı alan bir vaka, bu nadir durumun ve ayırıcı tanının önemini vurgulamak amacıyla sunulmaktadır.

44 yaşındaki erkek hasta, yaklaşık bir gün süren sağ kol ve bacakta tek taraflı güçsüzlük ile motor afazi ile karakterize konuşma bozukluğu şikayetleriyle başvurdu. Hasta, stresle tetiklenen ve 3-5 yılda bir tekrarlayan, fotofobi ve fonofobi ile birlikte görülen migren benzeri zonklayıcı baş ağrılarından bahsetti. Tıbbi geçmişinde tiroid cerrahisi ve 20 paket-yıl sigara öyküsü, ayrıca annesi ve amcasında benzer atak öyküsü olduğu öğrenildi. Nörolojik muayenede motor afazi ve sağ ekstremitelerde 4/5 kas gücü saptandı ancak başka patolojik bulguya rastlanmadı. Laboratuvar sonuçları, EEG ve kraniyal manyetik rezonans görüntüleme (MRI) normaldi. Hastanede yatışı sırasında, uzamış semptomlar nedeniyle enoksaparin ve lamotrijin tedavisi başlandı. Semptomlar 2-3 gün içinde kademeli olarak iyileşti ve üçüncü gün sonunda tamamen düzeldi.

Tek taraflı motor zayıflık ve konuşma bozuklukları ile birlikte migren benzeri ataklarla başvuran hastalarda, görüntüleme ve laboratuvar bulguları normal olduğunda ailevi hemiplejik migren düşünülmelidir. Bu nadir tanının tanınması, gereksiz tetkik ve tedavilerden kaçınılması açısından hayati öneme sahiptir.

Anahtar Kelimeler: Vaka Raporu, Ailevi Hemiplejik Migren, Migren.

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Introduction

Hemiplegic migraine (HM) is a subtype of migraine with aura accompanied by reversible motor weakness. It frequently begins in childhood or early adulthood. Its prevalence is approximately 0.01%. It is three times more common in women than men (1).

It is divided into familial and sporadic forms, with the familial form referred to as familial hemiplegic migraine (FHM) (2). A family history is observed in 18% of patients with hemiplegic migraine. It follows an autosomal dominant (AD) inheritance pattern. In half of the families, a mutation in the CACNA1A gene located on chromosome 19p13, encoding the pore-forming alpha-1A subunit of voltage-gated P/Q-type calcium channels, is found. In approximately 15% of cases, a mutation in the ATP1A2 gene located on chromosome 1q23, encoding the alpha-2 subunit of the sodium/potassium pump, has been identified. In about 20% of cases, no genetic localization has been determined (3-6). Differential diagnoses include epilepsy (Todd's paresis), transient ischemic attack, stroke, metabolic disturbances, infections, and rare syndromes (Table 1).

Table 1.
Familial Hemiplegic Migraine Differantial Diagnosis

Condition	Distinguishing Features
Transient Ischemic Attack	Sudden onset, typically in older adults, risk factors (e.g. hypertension, atrial fibrillation), symptoms last <24h, imaging may show vascular changes
Stroke	Persistent deficits, positive neuroimaging, not fully reversible
Epilepsy (Todd's Paresis)	Preceding seizure activity, EEG abnormalities, rapid resolution of weakness
Metabolıc Disorders (e.g. Hypoglycemia)	Altered mental status, blood test abnormalities
Meningitis/Encephalitis	Fever, neck stiffness, altered consciousness, CSF abnormalities
Mitochondrial disorders (e.g. MELAS)	Lactic acidosis, stroke-like episodes, family history, elevated serum lactate

This case highlights familial hemiplegic migraine and the need to consider it during differential diagnosis.

Case

A 44-year-old male patient presented to our clinic with complaints of unilateral weakness in the arm and leg lasting approximately one day and speech disturbance (inability to fully articulate words), which began around age 15. It was learned that his complaints were accompanied by throbbing, unilateral headaches with photophobia and phonophobia. The headaches, lasting about one day, gradually decreased, and the attacks recurred once every 3-5 years. The headaches were triggered by stress. The patient's past medical history included thyroid surgery and a 20 pack-year smoking history. In the family history, it was noted that his mother and uncle had experienced similar episodes.

On neurological examination, the patient was conscious with motor aphasia, and the muscle strength of his right extremities was 4/5. Routine laboratory values were unremarkable. EEG findings were within normal limits, and electrocardiography (ECG) was normal. Previous etiological investigations for stroke performed at

an external center under the preliminary diagnosis of transient ischemic attack were within normal limits. Cranial magnetic resonance imaging (MRI) was evaluated as normal.

During hospitalization, enoxaparin was started, and due to the prolonged attack symptoms, lamotrigine was initiated. The symptoms gradually improved within 2-3 days. Initially, improvement in hemiparesis was observed within a few hours. By the end of the first day, word articulation started, although the patient had

Discussion

HM was first described by Clark in 1910, who emphasized that the clinical presentation of recurrent motor weakness and headache could be due to migraine (7). Later, additional case series were reported, expanding the clinical understanding of the condition. According to the 2013 classification of the International Headache Society, HM is diagnosed based on migraine with aura criteria, at least two attacks, reversible motor weakness, and the presence of at least one symptom of visual, sensory, or speech disturbances, each aura symptom lasting longer than 5 minutes but less than 24 hours. In familial cases, the presence of at least one first- or second-degree relative with a similar history is diagnostic (8).

Clinical data indicate that HM frequently begins between the ages of 10-15 (1). Our patient's symptoms began at a similar age. Migraine is the most common type of chronic episodic headache. Childhood migraine prevalence ranges between 3-10.6% (9). The clinical presentation in children can vary widely and may occur at any age. In pediatric migraine, focal neurological findings, particularly hemiplegia, may accompany headache attacks. Hemiplegic migraine is diagnosed based on unilateral weakness during migraine attacks (10).

Neurological deficits typically last 15-60 minutes in most cases. Attacks usually begin in childhood, adolescence, or early adulthood. Diagnosis may be delayed in the absence of a family history (10). Hemiplegic migraine attacks can also be accompanied by fever, lethargy, confusion, ataxia, hemianopia, sensory symptoms, seizures, and loss of consciousness. While neurological deficits usually resolve completely after the attack, they may occasionally persist (10).

Familial hemiplegic migraine was first described by Whitty et al. in 1953 (11). Pathophysiological mechanisms of migraine may involve genetic mutations, neurogenic inflammation, neuropeptides, altered neurophysiology, brainstem activation, and cortical spreading depression. Cortical spreading depression activates the trigeminal nucleus caudalis, leading to dilation of extracerebral circulation, particularly the meningeal arteries, causing headaches (12).

Genetic testing was not performed in this case due to limited availability of genetic analysis in the local clinical setting and the absence of progressive or atypical features that would have altered the management approach. Nevertheless, the clinical picture and the clear autosomal dominant inheritance pattern strongly supported the diagnosis.

The diagnosis of HM is one of exclusion, confirmed by history and routine biochemical, hematological, lumbar puncture, and imaging studies (13). Bradshaw et al. described HM cases in 1965, noting weakness lasting less than an hour in 58% of patients (14). In our case, weakness lasted several hours.

Acute neurological deficits in HM typically resolve quickly, with EEG showing focal slowing during acute episodes, recurrent attacks in the history, and family history supporting the diagnosis. The aura and headache characteristics in our case were consistent, with both visual aura and aphasia present as symptoms. Acute neurological deficits resolved rapidly. Imaging findings in diffusion-weighted MRI (DWI) and ADC sequences may appear normal or hyperintense, while T2-weighted images may show edema resulting from vasogenic causes (5,15). Cranial MRI in our case was normal.

Mild head trauma or angiography can trigger headaches (4). Increased perfusion may be detected in angiography, but caution is necessary as it may worsen clinical findings. Diffuse, severe, throbbing headaches occurring after contrast administration resolve spontaneously within 72 hours (8). Our patient had no history of trauma or interventional procedures such as angiography

Differential diagnoses include epilepsy (Todd's paresis), transient ischemic attack or stroke, metabolic abnormalities (hypercapnia, hypoglycemia, hyponatremia, hypocalcemia), liver or kidney failure, antiphospholipid syndrome, meningitis, and encephalitis (19).

HM is known to be associated with episodic cerebellar ataxia (EA) in 50% of cases. EA type 2 is acetazolamide-responsive paroxysmal cerebellar ataxia, with inheritance linked to similar mutations on chromosome 19. Nonsense mutations cause HM, while frameshift mutations result in EA type 2. The presence of cerebellar ataxia as part of the HM clinical spectrum is not surprising (20). Permanent neurological deficits, including ataxia and cerebellar dysfunction, are observed in 20% of familial cases (21). Nystagmus occurs transiently in 75% and ataxia in 40% of cases (13).

Another diagnosis to consider in differential diagnosis is alternating hemiplegia. This rare condition involves recurrent hemiplegic attacks that may affect one or both sides of the body, accompanied by autonomic changes, nystagmus, ocular motor palsy, and cognitive dysfunction.

Conclusion

The patient was diagnosed with familial hemiplegic migraine based on diagnostic criteria, the absence of pathological findings in imaging and biochemical tests, autosomal dominant inheritance, and the exclusion of other diseases in the differential diagnosis.

This case highlights the importance of considering familial hemiplegic migraine in patients presenting with recurrent motor symptoms and negative neuroimaging, especially when a family history is present.

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References

1. Pelzer N, Stam AH, Haan J, Ferrari MD, Terwindt GM. Familial and sporadic hemiplegic migraine: diagnosis and treatment. Curr Treat Options Neurol. 2013;15(1):13-27.
2. Olesen J, Tfelt-Hansen P, Welch KM. The headaches. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2000. p. 532-4.
3. Silberstein SD, Lipton RB, Dalessio DJ. Wolff's headache and other head pain. 7th ed. New York: Oxford University Press; 2001. p. 546-7.
4. Politi M, Papanagiotou P, Grunwald IQ, Reith W. Case 125: hemiplegic migraine. Radiology. 2007;245(2):600-3.
5. Dreier JP, Jurkat-Rott K, Petzold GC, Tomkins O, Klingebiel R, Kopp UA, et al. Opening of the blood-brain barrier preceding cortical edema in a severe attack of FHM type II. Neurology. 2005;64(12):2145-7.
6. Chabriat H, Vahedi K, Clark CA, Poupon C, Ducros A, Denier C, et al. Decreased hemispheric water mobility in hemiplegic migraine related to mutation of CACNA1A gene. Neurology. 2000;54(2):510-2.
7. Clarke JM. On recurrent motor paralysis in migraine. BMJ. 1910;1(2582):1534-8.
8. Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition (beta version). Cephalalgia. 2013;33(9):629-808.
9. Serdaroğlu A. Çocukluk çağında migren. Klinik Pediatri. 2005;4:59-62.
10. Serdaroğlu G, Tütüncüoğlu S, Çallı C, Sarıoğlu B, Korkmaz H. Hemiplegic migraine with prolonged symptoms: case report. J Child Neurol. 2002;17(1):80-1.
11. Whitty CW. Familial hemiplegic migraine. J Neurol Neurosurg Psychiatry. 1953;16(3):172-7.

12. Karwautz A, Wöber C, Lang T, Böck A, Wagner-Ennsgraber C, Vesely C, et al. Psychosocial factors in children and adolescents with migraine and tension-type headache: a controlled study and review of the literature. Cephalalgia. 1999;19(1):32-43.
13. Black DF. Sporadic hemiplegic migraine. Curr Pain Headache Rep. 2004;8(3):223-8.
14. Bradshaw P, Parsons M. Hemiplegic migraine: a clinical study. Q J Med. 1965;34(133):65-85.
15. Jacob A, Mahavish K, Bowden A, Smith ET, Enevoldson P, White RP. Imaging abnormalities in sporadic hemiplegic migraine on conventional MRI, diffusion and perfusion MRI and MRS. Cephalalgia. 2006;26(8):1004-9.
16. Butteriss DJ, Ramesh V, Birchall D. Serial MRI in a case of familial hemiplegic migraine. Neuroradiology. 2003;45(5):300-3.
17. Masuzaki M, Utsunomiya H, Yasumoto S, Mitsudome A. A case of hemiplegic migraine in childhood: transient unilateral hyperperfusion on MR imaging and MR angiography. AJNR Am J Neuroradiol. 2001;22(9):1795-7.
18. Cha YH, Millett D, Kane M, Jen J, Baloh R. Adult-onset hemiplegic migraine with cortical enhancement and oedema. Cephalalgia. 2007;27(10):1166-70.
19. Bhatia H, Babtain F. Sporadic hemiplegic migraine with seizures and transient MRI abnormalities. Case Rep Neurol Med. 2011;2011:258372.
20. Bradley WG, Daroff RB, Fenichel GM, Marsden CD. Neurology in clinical practice. 4th ed. Philadelphia: Butterworth-Heinemann; 2000. p. 1861-2.
21. Joutel A, Tournier-Lasserve E, Bousser MG. Hemiplegic migraine. Presse Med. 1995;24(8):411-4.