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Case Report: Ischemic Strokes in a Young Woman With Manifestations of Multiple Sclerosis

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ABSTRACT

Background: The current case report aimed at describing the clinical, radiological, and immunological findings of a case of ischemic stroke due to acute thrombosis of the left internal carotid artery and multiple watershed infarctions mimicking Multiple Sclerosis (MS).

Clinical Presentation and Intervention: A 24-year-old right-handed Iranian female was initially diagnosed with Multiple Sclerosis (MS). She presented with weakness in right lower limb. The cerebral Fluid Attenuation Inversion (FLAIR) Magnetic Resonance Imaging (MRI) showed few small and round lesions in deep white matter, semi-oval centrums, paraventricular region, and subcortical region on left hemisphere. MS was suspected. The patient's neurological status worsened, after four days she presented hemi-paresis, dysarthria, and hemi-facial paresis. The cerebral Diffusion-Weighted (DW)-MRI, Apparent Diffusion Coefficient (ADC), Duplex Scan (DS), Complete Blood Count (CBC), coagulation, blood chemistry, blood lipids, and autoimmune and immunodiagnostic pathology were performed. Test for Anti-double stain DNA (dsDNA), IgG anti-cardiolipin antibodies, and lupus anticoagulant were positive. DNA bound lactoferrin, anti-Sm antibodies, Anti-Sjögren's-Syndrome-related Antigen (Anti-SSA) autoantibodies, IgM anti-cardiolipin antibodies, and Anti-beta-2 glycoprotein-1 (IgMIgG) were negative. Ischemic stroke due to acute thrombosis of the left internal carotid artery and multiple watershed infarctions were confirmed in the patient. Heparin and then warfarin therapy was started. At that time she was treated with warfarin, hydroxychloroquine (200 mg/d) and atorvastatin (20 mg/d). The outcome was favorable.

Conclusion: The current case presented with clinically susceptible symptoms of MS, but had a stroke. Therefore, stroke in young patients can mimic MS symptoms.

Keywords: Diagnosis, Multiple Sclerosis, Stroke

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Highlights

- Ischemic strokes in young patients can mimic multiple Sclerosis symptoms.
- Neurological assessment and findings of MRI allow differentiation of ischemic stroke and multiple Sclerosis.

Plain Language Summary

Multiple Sclerosis (MS) is one of the prevalent neurological disorders that often seen in young women. MS can be diagnosed based on clinical presentations and Magnetic Resonance Imaging (MRI) findings. MS has different clinical presentations and in some cases brain imaging findings are not specific. Thus, this disease can mimic other disorders. In most patients, with the help of MRI and other investigations, MS can be distinguished from ischemic stroke without difficulty. Occasionally, when MS presents acutely, stroke may be misdiagnosed as MS and vice versa. Our study patient presented with weakness in the right lower limb and imaging showed few small and round lesions that were seen in MS patients, too. Thus, MS was suspected in our patient. But more investigation revealed acute thrombosis of the left internal carotid artery and watershed ischemia. Therefore, ischemic stroke in young patients may be misdiagnosed as acute form of MS based on clinical and imaging findings.

Introduction

Multiple Sclerosis (MS) is a common neurological disease often observed in young females [1, 2]. MS is a chronic inflammatory, immune-mediated, debilitating disease that can damage myelin sheaths and the axons of Central Nervous System (CNS) and lead to demyelination and axonal loss [3]. Although successive versions of diagnostic criteria for MS differ in emphasis, MS can be diagnosed based on dissemination of disease in space and time reported by 2010 McDonald criteria [4].

In most patients, with the help of Magnetic Resonance Imaging (MRI) and other investigations, MS can be distinguished from ischemic stroke without difficulty. Occasionally, however, when it presents more acutely, stroke may be misdiagnosed as MS and vice versa. Moreover, MS diagnosis can be made after excluding other diseases that can explain clinical presentation [5, 6]. Immune process in MS disease leads to chronic inflammation that may last a long time [3, 4].

Previous studies showed that chronic inflammation in some inflammatory diseases including rheumatoid arthritis [7, 8], psoriasis [9, 10], and periodontitis [11, 12] cause endothelial dysfunction and accelerate atherosclerosis. This pathway is one of the important reasons of the progression of cardiovascular diseases such as ischemic stroke [13]. Cerebral Watershed Infarction (CWI), also called border zone infarction, is an ischemic lesion that involves the junction between two adjacent arterial territories. The pathophysiology of WI is not clear. Previous investigations found a link between WI and microemboli, from the heart or atherosclerotic artery, which reduces perfusion [14, 15]. The current report presents clinical, radiological, and immunological characteristics of a case with ischemic stroke mimicking, at the onset, MS.

Case Presentation

A 24-year old, right-handed Iranian female, taking no treatment, suddenly presented with right lower limb weakness, and was diagnosed with MS by her neurologist and the first Fluid Attenuation Inversion (FLAIR) MRI report (Figure 1). In June 2014, the patient referred to the Emergency Room of the Kashani Hospital affiliated to Isfahan University of Medical Sciences, Isfahan, Iran, with weakness in right lower limb and after four days weakness of the entire right side of her body. A clinical examination revealed right lower facial paresis, reduced muscle tone in the right arm and leg, a right-side impairment of pinprick perception, right hemianopia and Babinski's sign. Her medical history included intestinal infection when she was three years old with febrile seizure, constipation, and external hemorrhoids.

A cerebral Computed Tomography (CT) scan and MRI was performed; MRI revealed few small and round lesions in deep white matter, semioval centrums, paraventricular region, and subcortical region on left hemisphere. Based on the clinical and radiological findings, MS was diagnosed. The patient was referred to the MS clinic. The neurologic examination was normal, except weakness in right lower limb and psychomotor agita-

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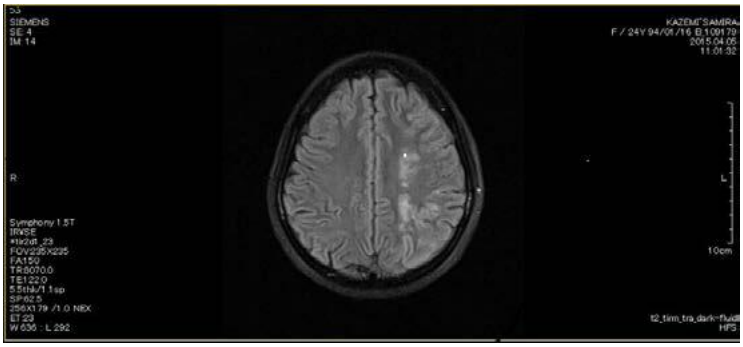

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Figure 1. FLAIR MRI; increase in signal intensity in the sub-cortical left parieto-occipital white matter

tion. During the hospitalization, the neurological status of the patient gradually worsened; after four days, she presented hemiparesis (worsening of weakness in the right lower limb without worsening in right upper limb), dysarthria, hemifacial paresis, and depression.

The cerebral Diffusion-Weighted (DW)-MRI detected ischemic areas in subacute state in the left middle cerebral artery territory and the junctional territories of right posterior cerebral artery and middle cerebral artery (Figure 2), with about 25% decline in Apparent Diffusion Coefficient (ADC) values in infarcted areas (Figure 3) and hemorrhagic transformation in the left profound middle cerebral artery area (Figure 4). The partial occlusion of the left internal carotid artery with ulcerated hypo-echo plaque was diagnosed by Duplex scan (Figure 4). There was no evidence of intra or extra-dural mass in cervical MRI.

Tests were positive for Anti-Nuclear Antibody (ANA), Anti-double stain DNA (dsDNA), IgG anti-cardiolipin antibodies, and lupus anticoagulant. Tests were negative for DNA bound lactoferin, Anti-Sm antibodies, Anti-Sjögren's-Syndrome-related Antigen A (Anti-SSA) autoantibodies, IgM anti-cardiolipin antibodies, and IgG and IgM Anti-beta-2 glycoprotein. There were no symptoms of Systemic Lupus Erythematosus (SLE) or other signs of thrombophilia. The patient was diagnosed with ischemic stroke and multiple watershed infarctions due to microemboli from ulcerated plaque at the left internal carotid artery. Heparin and then warfarin therapy was started. The patient was discharged and referred after two weeks to the Department of Neurology, Kashani Hospital. On admission to the Department of Neurology, clinical characteristics were: BP 130/75 mmHg, heart rate 78 bpm, and sinus rhythm.

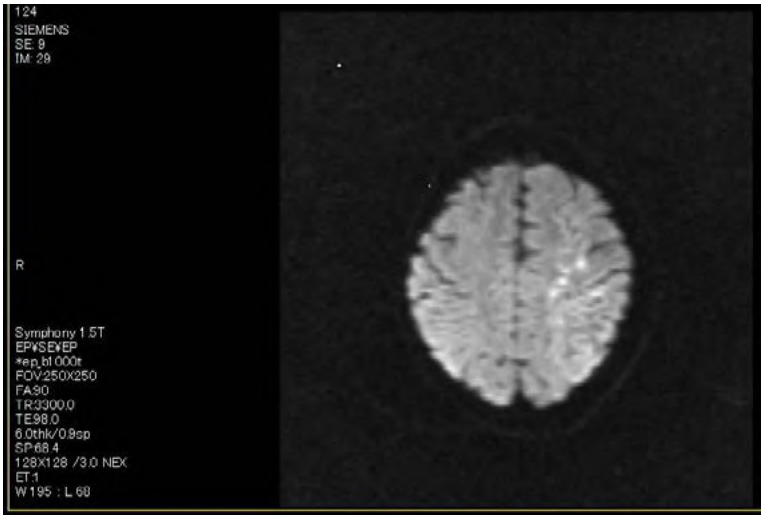

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Figure 2. Cerebral DWI-MRI; ischemic areas in the left MCA territory and at the junctional territories of right posterior cerebral artery and MCA

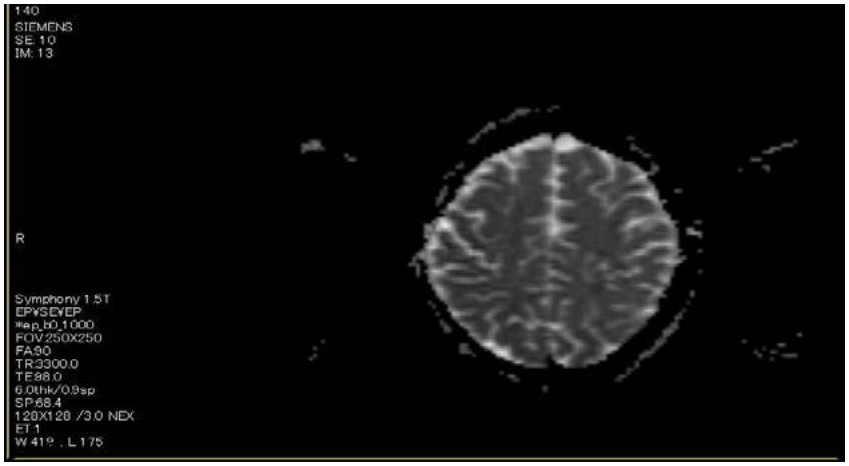

Figure 3. Cerebral ADC images; lower ADC values in infarcted areas

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The neurologic examination showed right homonymous hemianopia, right central facial paresis, right hemiparesis (1/5 MRC), brisk Deep Tendon Reflexes (DTRs), right Babinski's sign, and dysarthria. The Electrocardiography (ECG) revealed sinus rhythm and QRS axis-60 degrees. Duplex scan of cervico-cerebral arteries evidenced occlusion of left internal carotid artery. Echocardiography examination was normal. Based on clinical and paraclinical (laboratory and imaging) findings, the diagnosis was confirmed: secondary antiphospholipid syndrome, acute thrombosis of the left internal carotid artery, and multiple watershed infarctions in the junctional territory of left posterior and middle cerebral artery. She was currently treated with warfarin, to keep International Normalized Ratio (INR) between 2 and 3, plus hydroxychloroquine (200 mg/d) and atorvastatin (20 mg/d). On the discharge day, the patient's motor deficit improved (3/5 MRC) and she was able to repeat some words.

Discussion

Ischemic stroke can mimic MS both clinically and on MRI, and cerebral ischemic events can occur as an early manifestation of MS [16]. SLE is also a very complex disease that may involve CNS. The factors contributing to ischemia in SLE are anti-cardiolipin antibodies, other antibodies, atherosclerosis, small vessel vasculopathy, thrombosis, emboli, dissection, vasculitis, vessel spasm, and other risk factors. Both stroke and transient ischemic attacks can occur as an early manifestation of SLE [17] and anti-cardiolipin antibodies are established risk factors for ischemic stroke [18, 19] and SLE [20-25]. The presence of these antibodies increases the risk of cerebral vascular events in patients with immune-mediated disorders [26].

In the first evaluation, the current case was misinterpreted as MS, but after neurological, immunological, and radiological assessments, watershed ischemia was confirmed. Some studies recently show the increased

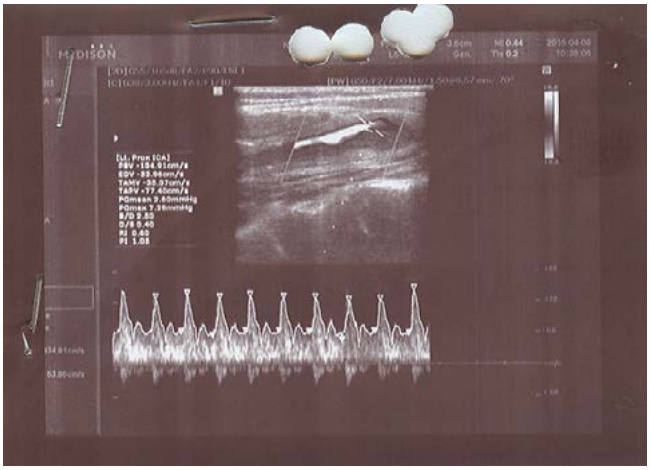

Figure 4. Duplex scan; partial occlusion of the left internal carotid artery with hypo-echo ulcerated plaque

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prevalence of ischemic stroke in patients with MS [27-30]. One of the important risk factor for ischemic stroke is age [31-34]. The probability of a coincident ischemic stroke in the patient was considered; but it was unlikely, given that the subsequent clinical and imaging assessment was typical for ischemic stroke.

The current case was erroneously misinterpreted as MS initially. Similar symptoms and imaging of the disease, high incidence of MS in our population, and a low likelihood of ischemic stroke in a very young female patient were the reasons of misdiagnosis.

Conclusion

In conclusion, based on the patient`s symptoms, at first MS was suspected, but after neurological assessment, ischemic stroke was diagnosed suggesting that ischemic stroke in young patients may be misdiagnosed as an acute form of MS on clinical and imaging examinations. Despite uncertainty concerning the underlying disease mechanism, ischemic stroke can display some acute MS lesions. Neurological assessment and MRI evaluation allow differentiation of the two diseases. This case allowed identifying already known, but also rare, clinical picture in overlap SLE, anti-carliolipin antibody syndrome and ischemic stroke.

Ethical Considerations

Compliance with ethical guidelines

An informed consent was taken from patient before enrollment.

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Authors contributions

The authors contributions is as follows: Conceptualization: Mohsen Janghorbani and Mahdi Barzegar; Methodology: All authors; Investigation: Mahdi Barzegar and Omid Mirmosayyeb; Writing–original draft: Mohsen Janghorbani, Mahdi Barzegar and Omid Mirmosayyeb; Writing–review & editing: Vahid Shaygannejad and Mahdi Barzegar; and Supervision: Vahid Shaygannejad.

Conflict of interest

There was no conflict of interest.

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