

Co-occurrence of multiple sclerosis and Parkinson disease

Vahid Shaygannejad¹, Maryam Shirmardi¹, Leila Dehghani^{1,2}, Helia Maghzi¹

¹Isfahan Neurosciences Research Center, Alzahra Hospital, Department of Neurology, Isfahan University of Medical Sciences,

²Department of Medical Sciences, School of Medicine, Najafabad Branch, Islamic Azad University, Isfahan, Iran

Abstract

Parkinson disease (PD) is a neurodegenerative disease of the central nervous system (CNS) with the highest prevalence in adults over 60 years of age. On the other hand, multiple sclerosis (MS), which mostly affects individuals between 20 and 40 years of age, is another neurodegenerative and autoimmune disease of the CNS, however, less common than PD. Here we aim to report the case of a 39-year-old woman, who developed PD 18 years after diagnosis of MS.

Key Words: Multiple sclerosis, neurodegenerative disease, Parkinson disease

Address for correspondence:

Dr. Helia Maghzi, Department of Neurology, Isfahan Neurosciences Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

E-mail: Helia.Maghzi@yahoo.com

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INTRODUCTION

Parkinson disease (PD) is a neurodegenerative disease of the central nervous system (CNS), with the highest prevalence in adults over 60 years of age.^[1] On the other hand, multiple sclerosis (MS), which mostly affects individuals between 20 and 40 years of age, is another neurodegenerative and autoimmune disease of the CNS, however, less common than PD.^[2]

Destruction of the dopaminergic pathway in the basal ganglia, especially the substantia nigra, is the hallmark of PD, and demyelinating plaques, with a preference for the subcortical white matter and periventricular area, are seen in MS patients.^[3,4]

A number of case reports has suggested a co-occurrence of MS and PD.^[4-12] Two hypotheses have explained the link between these two diseases, one is the coincidental co-occurrence and the other is a casual relation, wherein, PD can develop because of the demyelinating plaque in the basal ganglia of MS patients.

Here we aim to report the case of a 39-year-old woman, who developed PD 18 years after diagnosis of MS.

CASE REPORT

A 39-year-old woman, with a negative family history, complained of an insidious onset of paresthesia in the left leg and arm, which became apparent at the age of 21 years. After excluding other possible diagnosis at that time, the clinical examination and MRI findings confirmed the diagnosis of MS, according to McDonald's criteria. Treatment for MS with beta-interferon 1a was begun.

During these 18 years, the patient experienced two more relapses: The first time was with paresthesia in the left leg and arm that she fully recovered from with intravenous methylprednisolone treatment. The second time was eight years ago, when she experienced

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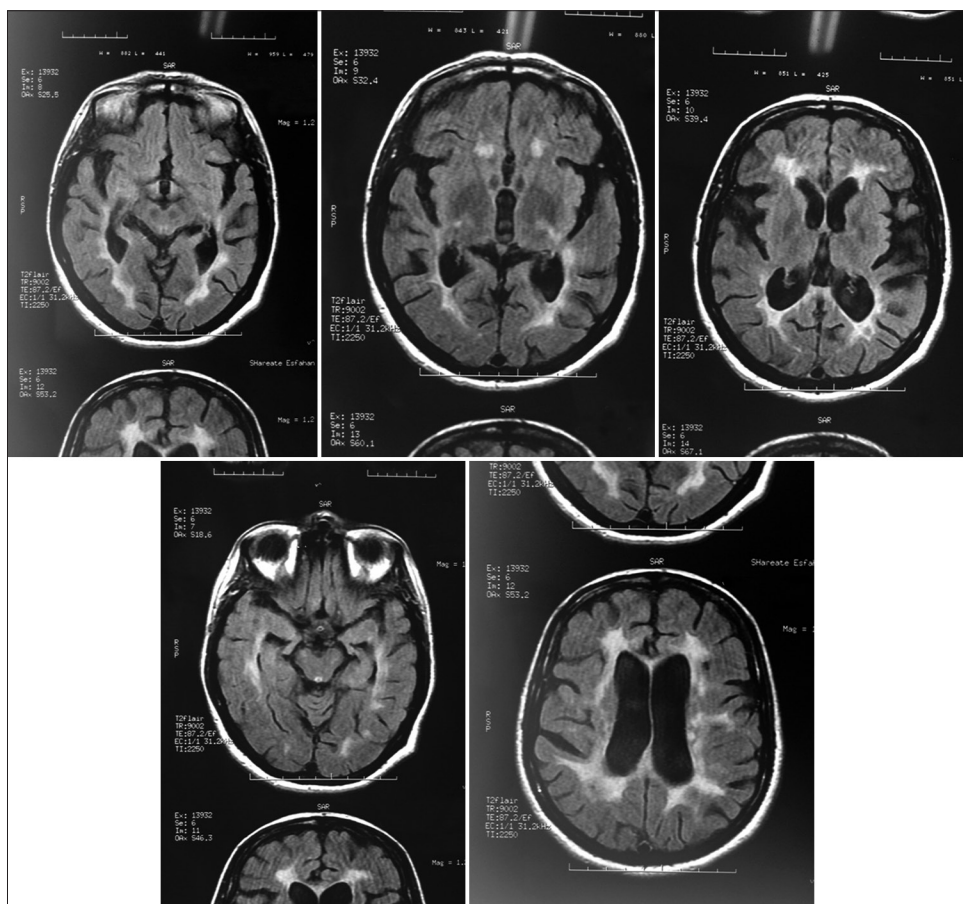


Figure 1: The axial flair MRI of the brain of the patient with periventricular confluent hyper signal plaques

frequent imbalance and recurrent falls, however, this time after pulse therapy she did not fully recover.

From two to three months ago, she has developed spasms in both legs and since one month she has complained of tremor and rigidity in her hands. Physical examination revealed 2+ reflexes in her hands and 3+ reflexes in her legs; cogwheel rigidity in her arms and spasticity in her legs also existed. Her gait is spastic and tandem gait is damaged, her arm swing during walking is lost, and the Glabellar reflex is positive. In a reposed position, she has rest tremor in her hands.

The finger-to-nose test, which is an indicator of coordination, is also damaged. Other neurological examinations are within normal limits.

The repeated brain magnetic resonance imaging (MRI) showed a gadolinium enhancing plaque in c6–c7, with no signal change in the basal ganglia [Figure 1]. Therapy with anticholinergic trihexyphenidyl (6 mg/day) and levodopa (300 mg/day) was begun and her response to these drugs was excellent.

DISCUSSION

Co-occurrence of PD and MS is rare. A number of case reports have been described, in which the relationship between these two diseases was either coincidental or casual.^[4-12]

Coincidental reports were described in patients with an insidious onset of PD, with a good response to dopaminergic therapy or persistence of the symptoms despite corticosteroid therapy;^[11,13,14] however, a casual relationship is proposed to exist in patients with a rapid onset, strategically located demyelinating plaque, and excellent response to corticosteroid therapy for extrapyramidal signs. A casual relationship was reported in six case reports, wherein, demyelinating plaque was located in the vicinity of the thalamus, globus pallidus, and substantia nigra, and also the lateral substantia nigra and nucleus ruber.^[5,15-17]

Here, in our patient, there was no signal change in the MRI of the basal ganglia, and also a good response of the patient to dopaminergic therapy may be the clue,

which points to the coincidental relationship of MS and PD in this patient.

An increased relative risk of PD in MS patients was reported in a Swedish cohort study,^[18] however, in contrast to these findings, a case-control study on the Danish population, showed no link between PD and autoimmune disease; however, in that study, the number of MS patients in the control group was higher than in the case population.^[19]

As the life expectancy of MS patients over time has improved, the chance of developing PD in MS patients has become more apparent, so that should be considered in older MS patients, who are commonly subjected to underdiagnosis of other comorbidities such as PD.

CONCLUSION

Co-occurrence of MS and PD is rare. Here we have reported a case of development of PD, 18 years after diagnosis of MS.

REFERENCES

- de Lau LM, Breteler MM. Epidemiology of Parkinson's disease. *Lancet Neurol* 2006;5:525-35.
- Harris MK, Maghzi AH, Etemadifar M, Kelley RE, Gonzalez-Toledo E, Minagar A. Acute demyelinating disorders of the central nervous system. *Curr Treat Options Neurol* 2009;11:55-63.
- Minagar A, Barnett MH, Benedict RH, Pelletier D, Pirko I, Sahraian MA, *et al.* The thalamus and multiple sclerosis: Modern views on pathologic, imaging, and clinical aspects. *Neurology* 2013;80:210-9.
- Pedemonte E, Trabucco E, Cella M, Solaro C. Parkinsonism in multiple sclerosis patients: A casual or causal association? *Parkinsonism Relat Disord* 2013;19:492-3.
- Vieregge P, Klostermann W, Brückmann H. Parkinsonism in multiple sclerosis. *Mov Disord* 1992;7:380-2.
- Valkovic P, Krastev G, Mako M, Leitner P, Gasser T. A unique case of coincidence of early onset Parkinson's disease and multiple sclerosis. *Mov Disord* 2007;22:2278-81.
- Tranchant C, Bhatia KP, Marsden CD. Movement disorders in multiple sclerosis. *Mov Disord* 1995;10:418-23.
- Schultheiss T, Reichmann H, Ziemssen T. Rapidly progressive course of very late onset multiple sclerosis presenting with Parkinsonism: Case report. *Mult Scler* 2011;17:245-9.
- Saidha S, Mok TH, Butler M, Fanning N, Harrington H. Multiple sclerosis exceptionally presenting as parkinsonism responds to intravenous methylprednisolone. *J Clin Neurosci* 2010;17:654-5.
- Damásio J, Ramos C, Valdemar L, da Silva AM, Magalhães M. A coincidental case of young-onset Parkinson disease and multiple sclerosis. *Neurologist* 2011;17:286-8.
- Ozturk V, Idiman E, Sengun IS, Yuksel Z. Multiple sclerosis and parkinsonism: A case report. *Funct Neurol* 2002;17:145-7.
- Barun B, Brinar VV, Zadro I, Lusić I, Radović D, Habek M. Parkinsonism and multiple sclerosis--is there association? *Clin Neurol Neurosurg* 2008;110:958-61.
- Mao CC, Ganche ST, Herndon RM. Movement disorders in multiple sclerosis. *Mov Disord* 1988;3:109-16.
- Kreisler A, Stankoff B, Ribeiro MJ, Agid Y, Lubetzki C, Fontaine B. Unexpected aggravation of Parkinson's disease by a mesencephalic multiple sclerosis lesion. *J Neurol* 2004;251:1526-7.
- Maranhão-Filho PA, Moraes-Filho L, Camara LS, Salema CC. Fulminant form of multiple sclerosis simulating brain tumor: A case with parkinsonian features and pathologic study. *Arq Neuro psiquiatria* 1995;53:503-8.
- Federlein J, Postert T, Allgeier A, Hoffmann V, Pöhlau D, Przuntek H. Remitting parkinsonism as a symptom of multiple sclerosis and the associated magnetic resonance imaging findings. *Mov Disord* 1997;12:1090-1.
- Folgar S, Gatto EM, Raina G, Micheli F. Parkinsonism as a manifestation of multiple sclerosis. *Mov Disord* 2003;18:108-10.
- Li X, Sundquist J, Sundquist K. Subsequent risks of Parkinson disease in patients with autoimmune and related disorders: A nationwide epidemiological study from Sweden. *Neurodegener Dis* 2012;10:277-84.
- Rugbjerg K, Friis S, Ritz B, Schernhammer ES, Korbo L, Olsen JH. Autoimmune disease and risk for Parkinson disease: A population-based case-control study. *Neurology* 2009;73:1462-8.

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