



Cognitive Impairment and Dementia in Multiple Sclerosis – A Case Report

*** Dr. Lăcrămioara Pavăl**

M. D., Ph.D Student, Neurology Department, "Gr. T. Popa" University of Medicine and Pharmacy, Iasi, Romania; Psychiatrist, Psychiatric Medical Center "Sinapse", Iasi, Romania
* Corresponding author

Dr. Cristian Dinu Popescu

M.D., PhD, Univ. Professor, Neurology Department, "Gr. T. Popa" University of Medicine and Pharmacy, Iasi, Romania; Unit Head, Neurology Clinic, Rehabilitation Hospital, Iasi, Romania

ABSTRACT

Multiple sclerosis is the most common neurological disease of young adults that causes major disabilities. Psychiatric manifestations are frequent in these patients. Cognitive impairment represents some of the most difficult problems which impact a large number of patients with multiple sclerosis. These symptoms may progress to the stage of dementia and are the consequence of disease progression, followed by cerebral atrophy. The most frequently affected cognitive abilities are: memory, attention and executive functions. The diagnosis is difficult and dementia treatment management in multiple sclerosis is not easy and few patients get treatment for their psychiatric disorder. The most important way of treatment is the early use of disease modifying therapy and, when is required, specific dementia intervention. Therapy of cognitive dysfunction and dementia in multiple sclerosis is necessary and represents a real challenge for specialists because this neurological disorder has many specific features still unknown.

KEYWORDS

multiple sclerosis, cognitive impairment, dementia

Multiple Sclerosis – general data

Multiple sclerosis is a neurological disorder that causes significant motor, sensory, cerebellar and cognitive disabilities in young adults (20-40 years) with a prevalence of 80-100 per 100 000 (1,2).

People with multiple sclerosis have an increased prevalence of mental disorders compared to general population. Mood disorders (major depression) and cognitive dysfunction are the most common psychiatric disorders in multiple sclerosis with a negative impact on quality of life (3,4).

Cognitive Impairment in multiple sclerosis

Cognitive disorders are the consequence of primary axonal lesions (axonal degeneration) and are directly related to the neuropathological changes of the disease - progressive neuronal loss followed by cerebral atrophy. 45% - 60% of multiple sclerosis patients have cognitive problems.

The most common cognitive difficulties are the decrease of learning capacity, impaired working and long-term memory (immediate memory seems preserved), difficulties on concentrating and keeping attention in solving problems, finding words (5)

Pathogenic mechanisms

The pathogenic factors responsible for a higher prevalence of cognitive impairment in multiple sclerosis are not completely known, but brain imaging techniques provide useful information about:

- diffuse and focal lesions disrupt neural networks
- the frontal, temporal and hippocampal location increase the frequency and severity of cognitive disorders
- cortical plaques are the cause of cognitive problems, more

than cortical atrophy or white matter lesions

- some studies show that the imbalance between pro- and anti-inflammatory cytokines, neurotransmitters and other cell mediators within the brain can may cause in impaired cognitive function (6,7)

DSM 5 diagnosis criteria for dementia

Evidence of significant cognitive decline from a previous level of performance in one or more cognitive domains:

- complex attention
- executive function
- learning and memory
- language
- perceptual-motor cognition
- social cognition

The cognitive deficits interfere with independence in everyday activities (8)

Treatment

First step in therapy of dementia in multiple sclerosis is the specific immunomodulatory treatment of neurological disease (1).

Specific pharmacotherapy of dementia

- **acetylcholinesterase inhibitors** : donepezil, rivastigmine, galantamine

Donepezil provide benefits in mild and moderate cognitive dysfunction in multiple sclerosis and improves memory and learning ability.

rivastigmine might modulate the brain functional plasticity.

- *N-methyl-D-aspartate receptor antagonist*: memantine.

Studies with this medication reveals reduced benefits in improving cognitive dysfunction in multiple sclerosis. Other studies have shown inconclusive results (9, 10, 11).

Case report

A female patient, 52 years of age, diagnosed with multiple sclerosis relapsing-remitting form in 1997, presented with a history of cognitive dysfunction for the last 2 years. She does not receive disease-modifying therapy. The patient present attacks one a few years.

In 2011, the first cognitive symptoms occur: low speed of information processing, reduced ideation content, memory impairment, difficulties on concentrating and keeping attention, sleep disorders, fatigue.

The first psychiatric addressability is in August 2013. At that time, the investigation tests reveals 21 points on Mini Mental State Examination (MMSE) – a test that evaluates dementia – and a depressive episode associated. The 21 points shows mild dementia.

The patient receives an antidepressant therapy and donepezil 10 mg once a day about 3 months. She can not tolerate treatment due to side effects (headache, walking difficulties, unusual tiredness, irritability).

From March 2014 the treatment for dementia is changed with memantine 10 mg twice a day - without side effects. The re-valuation of MMSE scale in August 2014 reveals 18 points.

At present, MMSE = 17 points and the depressive episode is in complete remission.

During the treatment patient had a single attack on multiple sclerosis, in January 2014.

Discussion and Conclusion

Cognitive impairment is one of the most common psychiatric comorbidity in patients with multiple sclerosis and a negative predictive factor on quality of life. Specific psychiatric treatment slows the progression of dementia - the patient loses 3 points on MMSE scale in two years. Patients diagnosed with dementia but without treatment lose average 5-10 points / year on MMSE scale.

The most effective therapy include the specific immunomodulatory treatment + acetylcholinesterase inhibitors. Memantine is a viable alternative, but more studies are required.

Early recognition and treatment of dementia in multiple sclerosis are particularly important because delays cognitive decline, lead to better functional rehabilitation, increases adherence to immunomodulatory treatment and enhances social integration.

Conflict of interests: None.

REFERENCES

1. Băjenaru O. et al. Guidelines for diagnosis and treatment in neurology, Second edition, 2011: 218 – 238
2. Popescu B, Băjenaru O. Essential elements of clinical neurology. 2009: 200-207
3. Marrie RA, Fisk JD, Yu BN et al, CIHR Team in the Epidemiology and Impact of Comorbidity on Multiple Sclerosis. Mental comorbidity and multiple sclerosis: validating administrative data to support population-based surveillance, BMC Neurol. 2013 Feb 6;13:16
4. Chwastiak L. A., Ehde D. M. Psychiatric Issues in Multiple Sclerosis. Psychiatr Clin North Am. 2007; 30(4): 803–817
5. Guimarães J., José Sá M. Cognitive Dysfunction in Multiple Sclerosis. Front Neurol. 2012; 3:74
6. Sicotte N. L., Kern K. C., Giesser B. S. et al. Regional hippocampal atrophy in multiple sclerosis. Brain. 2008; 131: 1134- 1141

7. Simioni S., Ruffieux C., Bruggimann L. et al. Cognition, mood and fatigue in patients in the early stage of multiple sclerosis. Swiss Medical Weekly 2007; 137:496–501
8. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th edition (DSM-V). American Psychiatric Publishing. 2013
9. Gauthier S., Ballard C. Management of dementia. 2009
10. MS Forum. Cognition in multiple sclerosis. 2008
11. Prelipceanu D. Clinical psychiatry. 2011