A Case of Psychosis in a Patient Concurrently Diagnosed With Multiple Sclerosis Treated Successfully With Corticosteroids

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Multiple sclerosis (MS) is an autoimmune, inflammatory demyelinating disease of the central nervous system.[1] While uncommon, the prevalence of psychosis in MS (MS-P) has been reported in between 2% and 4% of patients, compared with 0.5% and 1% in the general population.[2] We present the case of a patient with no prior psychiatric/medical history, with acute-onset left facial droop and other stigmata of MS with subacute onset of psychosis, who was ultimately diagnosed with MS-P.

Case Report

The patient was a 27-year-old man with no prior psychiatric history who presented to the emergency department (ED) with religious/paranoid delusions and new-onset auditory hallucinations 4 days prior. The patient denied alcohol or illicit substance use, which was confirmed by blood alcohol level and urine drug screen. Two weeks earlier, the patient presented for left facial droop, with further evaluation remarkable for right > left upper extremity weakness with paresthesias and dysarthria. Magnetic resonance imaging (MRI) at that time demonstrated 7 T2 fluid-attenuated inversion recovery white matter hyperintensities, with central pontine and right mid corpus callosum lesions of 18 mm and 21 mm diameter, respectively, both consistent with active disease. As the patient left the ED against medical advice before being treated, he was admitted at this presentation for further evaluation and treatment of likely MS. We were consulted due to the patient's auditory hallucinations.

On evaluation, the patient continued to endorse auditory hallucinations and paranoid delusions. He denied depressed mood or suicidality/homicidality. The mental status examination was unremarkable, except for the psychotic thought content. He was oriented x 3, while his Brief Psychiatric Rating Scale (BPRS)[3] and Mini-Mental State Examination[4] scores were 41 and 28, respectively.

Table 1[2,5–9] provides the patient's complete medical evaluation, including magnetic resonance imaging (MRI) of the head and cerebrospinal fluid. The latter was remarkable for increased immunoglobulin G index = 1.5, 12 oligoclonal bands, and elevated myelin basic protein = 4.7 ng/mL.

The patient completed a 5-day course of methylprednisolone 1,000 mg/d. We elected to withhold antipsychotics, as the patient was neither lethal nor combative/aggressive. After 4 days, both auditory hallucinations and delusions started to wane, with a BPRS score of 31, and 3 days after methylprednisolone was completed, the patient denied any psychotic symptoms, with a BPRS score of 25. Additionally, all neurologic symptoms resolved. Unfortunately, the patient did not wish to take any medications for MS and was lost to follow-up.

Discussion

While our patient's psychosis occurred within 2 weeks of MS onset, evidence is divergent about this relationship. For instance, in initial reports of MS-P, neurologic symptoms uniformly preceded psychosis.[2] In a later study, only 20.9% of patients had a history of MS at presentation, while 34.1% presented with psychotic symptoms and were concurrently (during the initial workup) diagnosed with MS. Finally, 24.1% of patients had a previous history of psychotic symptoms at presentation.[10]

MS-P has been purported to be related to its neuropathology in periventricular white matter and temporal/frontotemporal regions.[8] As in our patient, MRI characteristics in MS-P include a higher periventricular lesion load (particularly around temporal horns of lateral ventricles) and an association between temporal lobe and frontotemporal/temporoparietal lesions.[9] Reportedly, diffuse periventricular lesions are found in 95.6% of cases, predominantly in temporal/frontal regions.[10]

Despite a well-established dose-related risk of neuropsychiatric side effects of corticosteroids,[11,12] we elected not to treat with antipsychotics but began immunosuppressive therapy. The latter is supported by a systematic review of MS-P, which reported immunosuppressive therapy to be significantly more effective than antipsychotics (odds ratio = 9.0).[10] Nonetheless, multiple low-dose atypical antipsychotics have also been efficacious in the treatment of MS-P.[8]

In summary, while uncommon, MS-P can occur throughout the course of the illness. Historically, 90%–100% of MS-P developed after the onset of neurologic symptoms,[13,14] although more recent studies indicate that MS-P can precede or be concomitant with MS diagnosis.[10] Our patient's initial presentation of left facial palsy and subsequent psychosis highlights the need for a broad differential diagnosis in the evaluation of these 2 symptoms.

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Table 1. Diagnosis of Multiple Sclerosis: 2017 Revisions of the McDonald Criteria, Application to Our Patient, and Psychosis in MS

	2017 McDonald Criteria[5]	Our Patient's Presentation	Psychosis in MS
Clinically isolated syndrome	Monophasic clinical episode	(+)	Not applicable
	Patient-reported symptoms with objective findings reflecting a focal or multifocal inflammatory demyelinating event in the CNS	Left facial droop; left- > right-sided upper extremity paresis; dysarthria; nystagmus	
	Developing acutely or subacutely	(+)	
	Duration of at least 24 hours, with or without recovery	(+) 2 weeks' duration	
	Absence of fever or infection	Vital signs stable; complete blood count: within normal limits; urinalysis, chest x-ray, blood cultures were unremarkable	
Dissemination in space	≥ 1 T2-hyperintense lesions a characteristic of MS in ≥ 2 of 4 areas of the CNS:		Not applicable
	Periventricular	(a) Periventricular lesions in the right corona radiata region, right midcorpus callosum lesion = 21 mm diameter; left peritrigonal white matter region of lateral ventricle	
	Cortical/juxtacortical	(b) Posterior right frontal lesion approximately 2.5 x 1.8 cm; more anterior, smaller lesion in the right frontal lobe approximately 1.5 x 1.2 cm	
	Infratentorial	(c) Central pontine lesion = 18 mm diameter	
	Spinal cord	(-)	
Dissemination in time	Simultaneous presence of gadolinium-enhancing and nonenhancing lesions at any times -OR-	(+) See above	Not applicable
	New T2-hyperintense and/or gadolinium-enhancing lesion on follow-up MRI, with reference to a baseline scan, irrespective of the timing of the baseline MRI -OR-	Not applicable due to CIS	
	Presence of CSF OCBs; no better explanation for the clinical presentation	CSF: (+) 12 oligoclonal bands; CSF: (-) HSV 1 and 2, JC virus, VDRL, Lyme, West Nile virus and Epstein-Barr virus, meningitis/encephalitis panel; (-) antineuronal, paraneoplastic/autoimmune antibodies (including, anti-NMDA-R); CSF: (-) ACE; serum*: MOG: < 1:10; (-) antiantinuclear antibody, DNA antibodies (double-stranded), Smith antibody, antiribosomal P, antineuronal, anti–SS-A; C3, C4, IL-6: within normal limits; anticardiolipid Ig-G, A, M: within normal limits; lupus anticoagulant: (-) p-ANCA, (-) c-ANCA: (-) SS-A antibody, SS-B antibody	
	Demonstration of CSF OCBs in the absence of atypical CSF findings allows for a diagnosis of MS	CSF: normal protein, glucose; without pleocytosis or presence of neutrophils, eosinophils	
Prevalence of psychosis	Not applicable	Not applicable	2%–4%[6]
Phenomenology of psychosis	Not applicable	(+) Auditory hallucinations, delusions of 4-day duration	Auditory hallucinations, delusions represent 50% of psychotic symptoms[7]
Proposed pathophysiology of psychosis	Not applicable	Periventricular lesion load (particularly in peritrigonal regions of lateral ventricles) Right frontal lesions Juxtacortical lesion in the right parietal region	Higher periventricular lesion load (particularly around the temporal horns of the lateral ventricles)[8] Lesions in temporal lobe[8] Frontotemporal, temporoparietal lesions[8]
Treatment/ psychosis	Not applicable	Methylprednisolone 1,000 mg/d for 5 days	Corticosteroids,[9] atypical antipsychotics[2]

*Complete metabolic count, thyroid function tests, and vitamin B_1, B_9, and B_{12} levels were within normal limits. Severe acute respiratory syndrome coronavirus and human immunodeficiency virus serologies were negative.
Symbols: (+) = present; (-) = not present.
Abbreviations: ACE = angiotensin converting enzyme, C3 = complement component 3, C4 = complement component 4, c-ANCA = antineutrophil cytoplasmic antibodies, CNS = central nervous system, CSF = cerebrospinal fluid, HSV = herpes simplex virus, IL-6 = interleukin-6, MOG = myelin-oligodendrocyte glycoprotein, MRI = magnetic resonance imaging, MS = multiple sclerosis, NMDA-R = *N*-methyl-D-aspartate receptor, OCB = oligoclonal bands, p-ANCA = perinuclear antineutrophil cytoplasmic antibodies, SS-A = Sjögren's syndrome A, SS-B = Sjögren's syndrome B, VDRL = venereal disease research laboratory.

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