

Psychiatric Symptoms in a Patient with Churg-Strauss Syndrome

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Abstract

We report a case of Churg-Strauss syndrome (CSS) in a patient with multiple cerebral infarctions and psychotic symptoms. A 67-year-old man presented a high-grade fever and delirium. He was clinically diagnosed with Churg-Strauss syndrome on the basis of the presence of asthma, neuropathy, blood eosinophilia, and increased myeloperoxidase-specific anti-neutrophil cytoplasmic antibody (MPO-ANCA) activities. Though multiple cerebral infarctions are irreversible, this patient's psychiatric symptoms improved with steroid treatment. Psychiatric symptoms associated with CSS are very rare.

Key words: Churg-Strauss syndrome, cerebral infarction, psychiatric symptoms

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Introduction

Churg-Strauss syndrome (CSS) is a systemic, small-vessel necrotizing vasculitis that occurs in several organ systems, particularly the lung, heart, peripheral nervous system, skin, gastrointestinal tract, and central nervous system (CNS). CNS involvement has been reported as a complication in 6% to 16% of CSS cases (1, 2). Symptoms are typically caused by cerebral infarction or hemorrhage, and psychiatric symptoms are very rare (3). Here, we report a case of Churg-Strauss syndrome in a patient with multiple cerebral infarctions and psychotic symptoms.

Case Report

A 67-year-old man was admitted to our hospital because of high-grade fever for 5 days and was found to be acutely developing symptoms of delirium. He had been diagnosed with bronchial asthma 3 years before admission. Physical examination showed that his blood pressure was 126/69 mmHg; pulse rate, 101 beats per minute; and body temperature, 38.2°C. He had no skin rashes or cervical lymph node enlargement. Neurological examination indicated that the cranial nerves showed no abnormalities. In motor function tests, he showed generalized weakness in both lower ex-

trémities. Deep-tendon reflexes were slightly increased in the left lower extremities. No other neurological abnormalities were detected.

Laboratory data upon admission revealed the following: leukocyte count, 11,000/ μ L; eosinophil count, 22%; C-reactive protein level, 4.31 mg/dL, rheumatoid factor (RF) level, 139 IU/mL; total immunoglobulin E (IgE) level, 3,032 IU/mL; and myeloperoxidase antineutrophil cytoplasmic antibody (MPO-ANCA) level, 575 EU. The test results are shown in Table 1.

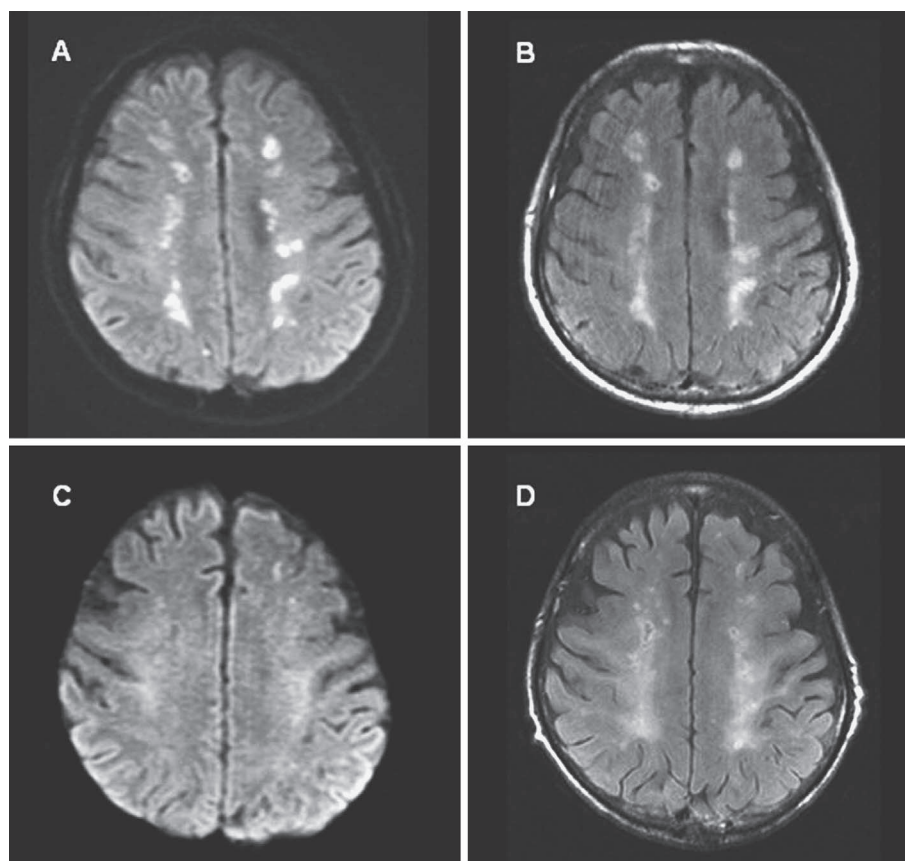
Computed tomography of the thorax indicated no infiltration. A pulmonary function test showed a mild obstructive pattern, and the degree of reversibility in expiratory volume in 1 second (FEV1) was 30.4% and 810 mL from prebronchodilator values. Examinations of the cerebrospinal fluid were also unremarkable.

Fluid attenuated inversion recovery (FLAIR) and diffusion-weighted magnetic resonance imaging (DWI) showed multiple hyperintense lesions in both the corona radiata and the bilateral deep white matter (Fig. 1) with a decreased apparent diffusion coefficient (ADC, not shown). Magnetic resonance angiography (MRA) showed no abnormalities. A nerve conduction study (NCS) showed mixed motor and sensory neuropathy, consistent with vasculitic mononeuritis multiplex.

After these examinations, the patient was clinically diag-

Table 1. Laboratory Data on Admission

Hematology		Biochemistry		Serology	
WBC	11000 / μ L	TP	5.9 g/dL	CRP	2.3 mg/dL
Neu	66.5 %	Alb	2.8 g/dL	IgE (RIST)	3032 IU/mL
Lym	8.5 %	T-Bil	0.6 mg/dL	IgG	1013 IU/L
Eo	22.0 %	AST	28 IU/L	RF	139 IU/mL
Ba	0.0 %	ALT	21 IU/L	ANA	(-)
Mo	3.0 %	LDH	387 IU/L	MPO-ANCA	575 EU
RBC	427 $\times 10^4$ / μ L	ALP	332 IU/L	Hemostasis	
Hb	12.4 g/dL	γ -GTP	84 IU/L	PT-INR	1.00
Ht	36.8 %	BUN	18 mg/dL	APTT	43.4 sec
Plt	16.5 $\times 10^4$ / μ L	Cr	0.86 mg/dL	Fibrinogen	852 mg/dL
Urinalysis		Na	135 mEq/L	Cerebrospinal fluid	
Occult blood	(-)	K	4.7 mEq/L	Cells	1 / μ L
Protein	(-)	Cl	101 mEq/L	Protein	18 mg/dL
RBC	10-19/HPF	Glu	115 mg/dL	Glucose	64 mg/dL
WBC	0-1 /HPF				

**Figure 1.** Brain MRI showed multiple hyperintense lesions in both corona radiata and the bilateral deep white matter on the DWI (A) and Flair (B). After three months, the previously observed DWI signal intensity lesion shows hypointensity (C) with hyperintensity on Flair images (D).

nosed with Churg-Strauss syndrome on the basis of the presence of asthma, neuropathy, eosinophilia, and increased MPO-ANCA activities, although biopsy was not performed.

On the suspicion that the patient had CNS vasculitis, pulse methylprednisolone therapy at a dose of 1 g per day intravenously for 3 days, followed by prednisone at dose of 60 mg orally every day, were instituted and tapered. He was administered quetiapine fumarate for psychiatric manifesta-

tions.

Weakness in both lower extremities improved slowly but continuously, and he became much less confused and agitated with one month of treatment. Three months later, he was receiving 20 mg of prednisone per day. MPO-ANCA levels were below the detection limit of the test and psychiatric symptoms almost disappeared. The previously observed DWI signal intensity lesion showed hypointensity with hy-

perintensity on FLAIR images and increased ADC values. This change was observed in the patterns of cerebral infarction and small vessel vasculitis.

Discussion

CSS is a systemic, small-vessel necrotizing vasculitis that occurs in several organ systems, but only affects the CNS in 6% to 16% of patients (1, 2). Involvement of small intracranial vessels is more likely to result in cerebral infarction or hemorrhage, and CNS involvement may cause significant morbidity and mortality (3, 4).

In the primary therapy, cyclophosphamide is typically used in combination with glucocorticoids for patients with severe, multiorgan disease. The decision to add cyclophosphamide is based on the five factors score (FFS), which includes the following 5 factors: cardiac involvement, gastrointestinal disease, renal insufficiency, proteinuria, and central nerve system involvement (5). In patients with a FFS of 2 or greater, addition of cyclophosphamide is recommended (6). For patients with a FFS of 1, however, insufficient data is available to make a clear recommendation regarding addition of cyclophosphamide. In the present case with a FFS of 1, glucocorticoid therapy alone was used for remission.

Few reports of cerebrovascular events are available that describe clear pathological findings. Small-sized vasculitis similar to CSS is seen in Wegener's granulomatosis. Drachman (7) reported 56 cases of neurologic involvement in a series of 104 patients with Wegener's granulomatosis, 3 cases with intracerebral hemorrhage, 3 cases with cerebral arterial thrombosis, and 1 case with intracerebral multiple granuloma. For multiple cerebral infarctions, proinflammatory cytokines, such as TNF- α and interleukin-1, may trigger procoagulant and proadhesive conditions for platelets, and endothelial injury and dysfunction are thought to be primary factors resulting in clot deposition (8).

Psychiatric symptoms associated with CSS have been reported in 2 cases in which aggressive treatment with steroids induced psychiatric improvement (9, 10). In the present case, since DWI and FLAIR showed hyperintensity with decreased ADCs, cytotoxic edema in an acute phase was suspected. After treatment for 3 months, DWI showed hypointensity with increased ADCs and hyperintensity on FLAIR images. Though multiple cerebral infarctions on FLAIR images are irreversible, psychiatric symptoms improved with steroid treatment. Kaplan et al (11) reported reversible dementia in a patient with idiopathic hypereosinophilic syndrome.

The cytoplasmic eosinophil granule contains toxic proteins, including major basic protein (MBP), eosinophil cationic protein (ECP), eosinophil peroxidase (EPO), and

eosinophil-derived neurotoxin (EDN). The principal granule protein, MBP, damages multiple cell types and organs (12, 13). EDN exhibits neurotoxic activity, as confirmed by the widespread loss of Purkinje cells and severe spongiform vacuolation in the white matter of cerebellum, brain stem, and spinal cord (14). ECP has been shown to be responsible for a hypercoagulable state, causing embolic infarctions (12, 13). These findings suggest that cytoplasmic eosinophil granules may cause psychosis as well as cerebral infarctions.

The present case illustrates that CSS is a risk factor for multiple cerebral infarctions and should be considered in patients with psychiatric symptoms and hypereosinophilia.

The authors state that they have no Conflict of Interest (COI).

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