Hashimoto’s encephalopathy presenting with multiple cranial nerve palsies and hemiparesis: A case report

Santanu Saha, Riddhi Das Gupta, Adreesh Mukherjee, Arijit Singha, Dhiman Das, Mrinal Kanti Roy

ABSTRACT

Introduction: Hashimoto’s encephalopathy is a steroid-responsive encephalopathy associated with elevated blood concentrations of antithyroid antibodies. The patients are usually euthyroid or mildly hypothyroid. A wide array of clinical features of Hashimoto’s encephalopathy has been reported till date. The pleomorphic manifestations may be behavioral and cognitive changes, myoclonus, seizures, pyramidal tract dysfunction, involuntary movements, cerebellar signs, psychosis and coma, with relapsing and progressive course. The diagnosis is often overlooked at presentation but is crucial, given that this is a treatable disease.

Case Report: We describe a case of Hashimoto’s encephalopathy presenting with multiple cranial nerve palsies and right sided hemiparesis in a 32-year-old male patient from West Bengal, India. Conclusion: This is the first reported case of multiple cranial nerve involvement in a case of Hashimoto’s encephalopathy.

Keywords: Hashimoto’s encephalopathy, Cranial, Palsies, Nerve, Multiple, Hemiparesis

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INTRODUCTION

Hashimoto’s encephalopathy is an uncommon neurologic syndrome associated with Hashimoto’s thyroiditis. It was initially described in 1966 [1], and it remains a diagnostic conundrum. The cause of Hashimoto’s encephalopathy is proposed to be autoimmune because of its association with other immunologic disorders (myasthenia gravis, glomerulonephritis, primary biliary cirrhosis, pernicious anemia and rheumatoid arthritis), female predominance, inflammatory findings in cerebrospinal fluid (CSF) and response to treatment with steroids [1, 2]. Other authors suggest that Hashimoto’s encephalopathy may represent an autoimmune cerebral vasculitis resulting from either endothelial inflammation or immune complex deposition [1-3]. Clinical findings are variable and nonspecific. The varied range of clinical presentations often lead to a delay in diagnosis and initiation of treatment. Although neurologic presentations like confusion, dizziness, hemiparesis, paraesthesia and involuntary movements have been documented, the involvement of multiple cranial nerves (CNs) was a hitherto unknown facet of this disease.

In this case report, we present the case of a patient with multiple cranial nerve involvement and right sided hemiparesis due to Hashimoto’s encephalopathy.
CASE REPORT

A 32-year-old male, non-smoker, non-alcoholic, not known to be a diabetic or hypertensive, presented to us with sudden onset right sided hemiparesis and deviation of angle of mouth to the left side for one day. This episode was preceded by hoarseness of voice and difficulty in swallowing for a week. The hoarseness of voice was of sudden onset and nonprogressive in nature. He also had severe headache at the time of admission. There was no history of fever, vomiting, convulsions, neck rigidity or loss of consciousness. There was no history of drug intake or exposure to toxins. He did not have any previous transient or permanent neurodeficit. He had normal bowel and bladder habits. There was no similar illness in any of his family members.

On examination, the patient was confused with hoarseness of voice and slurred speech. There was right sided hemiparesis with power - 3/5 in right upper and lower limbs, tone was normal in all four limbs and all the deep tendon reflexes were exaggerated. The plantar response was extensor on the right side. Doll’s eye phenomenon was present. There was right sided lower motor neuron type of facial nerve palsy (Figure 1) along with bulbar weakness with right sided IX and X CN palsy, absent gag reflex and a normal jaw jerk. Otorhinolaryngeal examination revealed right sided VIII cranial nerve paralysis and ipsilateral vocal cord paralysis. There was no tongue abnormality.

All routine investigations were essentially normal. ELISA for HIV was nonreactive. Further investigations revealed that Anti Nuclear Antibody (hep-2 pattern), anti-double-stranded DNA, anti-hepatitis B core antigen, hepatitis B surface antigen, anti-hepatitis C virus, lupus anticoagulant and Venereal Disease Research Laboratory test results were negative. Also, the anticylin antibody IgG level was 10.8 U/GPL (normal, <23 U/GPL), anticylin antibody IgM was 5.9 U/MPL (normal, <11 U/MPL). The cerebrospinal fluid study was normal and showed no evidence of any bacterial, tuberculous viral or fungal infection. The computed tomography (CT) scan (Figure 2) and magnetic resonance imaging (MRI) scan (Figure 3) of brain were normal. Electroencephalography studies were unremarkable.

Keeping in mind the possibility of an autoimmune etiology we went for a complete thyroid profile investigation including the serum anti-thyroid peroxidase antibody level estimation. The serum anti-TPO was high >1300 U/ml (biological reference interval of >60 U/ml considered positive). The serum FT4 and TSH were however normal. We then proceeded with a high-resolution USG of thyroid gland which showed heterogeneous nodular lesions in both lobes. FNAC from thyroid gland nodule showed that the overall cyt morphological features were suggestive of lymphocytic autoimmune thyroiditis (Figure 4).

Considering the clinical and laboratory findings, a diagnosis of “multiple cranial nerve palsies with right sided hemiparesis due to Hashimoto’s encephalopathy” was made.

Figure 1: Left sided LMN facial palsy in the patient with Hashimoto’s encephalopathy.

Figure 2: CT scan of brain showing no detectable abnormality in this patient.

The patient was started on 1 gm methylprednisolone, administered intravenously daily over three days. There was a rapid clinical response. He was switched over to oral prednisone starting at 1 mg/kg daily, with a slow taper. He came back for his routine check up after three weeks and had experienced significant resolution of symptoms.
epidemiologic study of neurologic symptoms consistent with HE estimated its prevalence to be about 2.1/100,000 [4]. The disorder occurs more frequently between age 44–46 years, with a female-to-male ratio of 4:1 [1, 5].

The clinical manifestations usually include acute to subacute onset of confusion with alteration of consciousness. Two major patterns of presentation are described: 1) 25% of patients follow a stroke-like pattern of multiple recurrent episodes of focal neurologic deficits with a variable degree of cognitive dysfunction and consciousness impairment [1, 2], and 2) the remaining 75% present with a diffuse progressive pattern of slow cognitive decline with dementia, confusion and hallucinations [1, 2]. These two clinical patterns may overlap over the course of the disease. Two-thirds of patients may experience focal or generalized tonic-clonic seizures, and 12% may present with status epilepticus. Also, myoclonus or tremor is seen in up to 38% patients, hyperreflexia and other pyramidal tract signs in 85% patients and psychosis, visual hallucinations and paranoid delusions have been reported in 25–36% patients [1, 2, 5]. However, the presence of multiple cranial nerve palsies with hemiparesis is a unique and unreported presentation of this disease. Our case is the first such report to throw light on an unknown presentation of HE.

The mechanism of Hashimoto’s encephalopathy does not appear to be related to the thyroid status, which can vary greatly in patients with this disease. In two recent reviews, 23–35% of patients had subclinical hypothyroidism, 17–20% had hypothyroidism, 7% had hyperthyroidism and 18–45% were euthyroid [1, 5]. The development of neurologic symptoms may occur up to three years before the onset of autoimmune thyroiditis [6].

The presence of elevated serum levels of antithyroid antibodies remains an essential characteristic of HE diagnosis, and suggests the presence of thyroid autoimmunity [1, 5]. Although in some cases, the diagnosis is supported by the association with Hashimoto’s thyroiditis, it is possible that some patients develop HE without a concomitant clinical thyroid disease because asymptomatic thyroid autoimmunity is frequent in these patients [1, 5].

The pathogenic role of thyroid antibodies remains unknown. There is no evidence that any antithyroid antibody reacts with brain tissue or affects nerve function and there is no clear correlation between the severity of the neurologic symptoms and the concentration of these antibodies [1, 4].

Antithyroid antibodies have also been related to other autoimmune conditions such as myopathy, depression, bipolar disease and dementia, but the prevalence of these antibodies in the general population (range: 2–20%) makes it difficult to establish whether a real association exists [7].

Infrequently, the titers of antithyroid antibodies (TPOAb and TgAb) are measured in the CSF. In one case series, nine of 12 patients with encephalopathy and elevated serum antithyroid antibodies had elevated CSF

**DISCUSSION**

Hashimoto’s encephalopathy is an unusual neurologic disorder whose etiology, pathogenesis and histologic characteristics are unclear. A systematic review published in 2003 [1] reported only 85 well-documented cases in the literature; however, this syndrome may be underrecognized. A hospital-based
autoantibody titers [4]. A systematic review found that 13% of published cases of HE reported antithyroid antibodies in the CSF [5]. However, the titers of antithyroid antibodies in the CSF do not correlate with the clinical stage of the disease, and the sensitivity and specificity of this finding remain unclear [4, 5].

An autoantibody against the amino terminal end of the enzyme α-enolase, an antigen of the thyroid and the brain, has been identified as a potential biomarker of Hashimoto’s encephalopathy [5, 8]. A study found serum autoantibody reactivity in five of six patients with Hashimoto’s encephalopathy compared to two of 17 patients with Hashimoto’s thyroiditis but no encephalopathy and in none of 25 healthy control subjects [8]. This antigen is also found in endothelial cells, suggesting an autoimmune vasculitic mechanism; however, this has not been confirmed by neuroimaging techniques [5].

In some patients, C-reactive protein and the erythrocyte sedimentation rate are elevated [9], and in one series, mild elevation of liver enzymes was found in 12 of 20 patients [9].

Although the CSF analysis results were normal in our patient, a lymphocytic pleocytosis has been found in 14% of reported patients; in 4% of patients, it may contain more than 100 cells/mm³. An elevated protein concentration occurs in 78% patients; and in 20% patients, it may be greater than 100 mg/dL. The blood glucose concentration is usually normal [1, 2].

Nonspecific EEG abnormalities are seen in 90–98% patients, which is usually a nonspecific slow background activity. The same pattern was observed in our patient. Focal spikes or sharp waves and transient epileptic activity are less common [2, 10].

In a review of 82 patients with HE, brain computed tomography or MRI showed abnormalities in 49% patients as cerebral atrophy, focal cortical abnormality, diffuse subcortical abnormality and nonspecific subcortical focal white matter abnormality.

The differential diagnosis of Hashimoto’s encephalopathy must consider any condition associated with delirium, rapidly progressive dementia, seizures or focal neurologic deficits [5]. Thus, the list of diseases that can be confused with HE is vast, including stroke or transient ischemic attack, cerebral vasculitis, carcinomatous meningitis, toxic metabolic encephalopathies, paraneoplastic syndromes, Creutzfeldt-Jakob disease, degenerative dementia and psychiatric diseases [1, 5].

The long-term prognosis is variable, although a high percentage of patients respond to treatment; others may have a progressive or a relapsing course [1, 5]. The symptoms usually improve with glucocorticoid therapy; however, it is not necessary. A systematic review of 85 published cases of Hashimoto’s encephalopathy found clinical response in 98% patients treated with glucocorticoids, 92% patients treated with glucocorticoids and levothyroxine and 67% of patients treated with levothyroxine only [1].

CONCLUSION

Hashimoto’s encephalopathy frequently presents with a myriad of neurological symptoms and normal findings in several different examinations. This syndrome may go unrecognized for a long time and the patient may be subjected to numerous investigations without definite benefit. Our case report uncovers a very unusual presentation of Hashimoto’s encephalopathy in the form of multiple cranial nerve palsies with right hemiparesis. Henceforth, this presentation if kept in mind while evaluating patients with a diagnostic dilemma, might help in instituting early and correct treatment.

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Author Contributions
Santanu Saha – Substantial contributions to conception and design, Drafting the article, revising it critically for important intellectual content, Final approval of the version to be published.
Riddhi Das Gupta – Substantial contributions to conception and design, acquisition of data, Drafting the article, revising it critically for important intellectual content, Final approval of the version to be published.
Adreesh Mukherjee – Substantial contributions to conception and design, analysis and interpretation of data, Drafting the article, revising it critically for important intellectual content, Final approval of the version to be published.
Arijit Singha – Substantial contributions to conception and design, acquisition of data, Drafting the article, Final approval of the version to be published.
Dhiman Das – Substantial contributions to conception and design, analysis and interpretation of data, Drafting the article, Final approval of the version to be published.
Mrinal Kanti Roy – Substantial contributions to conception and design, analysis and interpretation of data, Drafting the article, Final approval of the version to be published.

Guarantor
The corresponding author is the guarantor of Submission.

Conflict of Interest
The authors declare no conflict of interest.

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