Case Report: Subacute Sclerosing Panencephalitis Presenting as Acute Encephalitis

Ravindra Kumar Garg,^{1*} Neeraj Kumar,¹ Imran Rizvi,¹ Amita Jain,² Ravi Shekhar Jaipuriar,¹ Praveen Kumar Sharma,¹ Hardeep Singh Malhotra,¹ Danish Nasar Khan,² and Ravi Uniyal¹

¹Department of Neurology, King George's Medical University, Lucknow, India; ²Department of Microbiology, King George's Medical University, Lucknow, India

Abstract. Subacute sclerosing panencephalitis (SSPE) is still a common disease in India which is characterized by a progressive mental decline, myoclonus, periodic encephalographic abnormalities, and raised anti-measles antibody titer in the cerebrospinal fluid. Acute fulminant SSPE is characterized by a rapid course of disease culminating in death, within 6 months. We report of a 10-year-old boy, who came with a 14-day history of continuous involuntary jerky movements of the left half of the body, including the head. There was a highly increased anti-measles IgG antibody titer, both in the cerebrospinal fluid and serum. We conclude that acute rapidly progressive SSPE can present as acute encephalitis syndrome.

INTRODUCTION

Measles is still a common communicable disease, particularly in Africa and Asia. As per the recent WHO report, 7 million people were found to be affected with measles in 2016.¹ Approximately, 38% of Indian children fail to receive the basic immunization in the first year of life.² The Government of India introduced a second dose of measles vaccination drive in 14 high-risk Indian states with approximately 134 million children to prevent around 60,000 to 100,000 child deaths annually.³

Subacute sclerosing panencephalitis (SSPE) is a progressive neurological disorder caused by persistent measles virus infection.⁴ SSPE is characterized by progressive mental decline, myoclonus, and raised anti-measles antibody titer in the cerebrospinal fluid. Electroencephalography (EEG) in SSPE characteristically reveals generalized periodic complexes or discharges. A periodic EEG record, typically, consists of generalized and synchronous bursts of sharp-slow wave complexes. A typical discharge is polyphasic, with duration varying from 0.5 to 2 seconds; high voltage (300–1,500 mV); and repetitive (occurring every 4–15 seconds). Pathologically, there are diffuse perivascular lymphocytic infiltration and intranuclear eosinophilic inclusion bodies. Acute fulminant SSPE is characterized by a rapidly evolving downhill course culminating in death, within 6 months.^{4–7} We are reporting a child with rapidly evolving encephalopathy, and the child's cerebrospinal fluid demonstrates a high titer of anti-measles antibodies.

CASE REPORT

A 10-year-old boy, with normal growth and development, came with a 14 day-history of continuous involuntary jerky movements of the left half of body, including the head. His symptoms started 15 days before, following a generalized seizure. His mother noticed a subsequent progressive mental decline. The patient was completely unvaccinated, and his parents were not sure of measles infection in his early childhood. Motor examination revealed that the patient had left hemiplegia and he was nonambulatory. The Babinski's sign

was positive on the left side, and the sensory examination was apparently normal. Moreover, there were no signs of meningeal irritation. On his 4th day in the hospital, his condition worsened and he became completely mute. He started having similar clonic movements in his right lower limb and left distal upper limb with a reduction of motor activity in the left leg. He developed weakness in the right lower limb too (Supplemental Video). Routine blood parameters were normal, and the EEG revealed generalized slowing. Cerebrospinal fluid analysis revealed no abnormality (five cells, 20% protein, and 70% sugar). ELISA tests, in the cerebrospinal fluid, for dengue, Japanese encephalitis, herpes simplex virus, and West Nile viruses were negative. There was a highly increased anti-measles IgG antibody titer (ELISA; NovaTec Immundiagnostica GmbH, Dietzenbach, Germany), both in the cerebrospinal fluid and serum (20.44 NovaTec Units and 26.8 NovaTec Units; negative < 9 NovaTec Units). Brain magnetic resonance imaging showed focal T2 hyperintensity in the right parasagittal cortex (Figure 1). The patient was treated with levetiracetam and clobazam; also, intravenous midazolam in the dosage of 0.2 mg/kg stopped the jerks within 10 minutes, only to reappear after an hour of the dosage. The patient was also treated with intravenous methyl prednisone for 5 days. However, the condition of the patient kept on deteriorating and he became akinetic and mute. The family was counseled about the disease, and they preferred to take him home. The child died approximately 1 month after leaving the hospital.

DISCUSSION

In this patient, because of presence of anti-measles antibodies in high titer in the cerebrospinal fluid, a reasonable diagnosis of SSPE can be considered. There are certain important points that need to be highlighted. First, the course was exceptionally rapid, and second, the clinical presentation was different as there was no classical periodic myoclonus, instead the patient had epilepsy partialis continua-like manifestations. Magnetic resonance imaging showed a parasagittal circumscribed hyperintense lesion localized to the right parietal cortex. In fact, the patient fulfilled the diagnostic criteria of acute encephalitis syndrome.

Epilepsy partialis continua is, in fact, status epilepticus of focal onset with preserved awareness. There is repetitive clonic muscle jerking of one part of the body. Repetitive muscle twitching can keep on occurring over a period of days

* Address correspondence to Ravindra Kumar Garg, Department of Neurology, King George's Medical University, Lucknow 226003, India. E-mail: garg50@yahoo.com

FIGURE 1. Brain magnetic resonance imaging showing focal T2 hyperintensity in the right parasagittal cortex.

or weeks at regular intervals. Epilepsia partialis continua can also be associated with postictal confusion and/ or Todd's paralysis.⁸ Electroencephalography findings, in epilepsia partialis continua, are frequently lateralized to one cerebral hemisphere. Characteristic focal EEG abnormalities are focal spikes, sharp waves and slow waves, and periodic lateralized epileptiform discharges.⁹ Many encephalitic disorders, such as Rasmussen's encephalitis, autoimmune encephalitis, and herpes simplex encephalitis, can clinically manifest as epilepsia partialis continua.^{10,11} Epilepsia partialis continua has also been described in SSPE, but these patients have generalized periodic EEG abnormalities.¹²

The clinical features of fulminant SSPE are, frequently, atypical and can be misleading. Our case of fulminant SSPE mimicked the acute encephalitis syndrome. According to the WHO definition, acute encephalitis syndrome is characterized with fever and change in the mental status (such as confusion, disorientation, coma, or mutism) with or without seizures. Acute encephalitis syndrome is highly endemic to certain parts of India. In India, Japanese encephalitis is the leading cause of acute encephalitis syndrome. Dengue, West Nile virus, herpes simplex, mumps, Epstein-Barr, and influenza are other viruses that can clinically present with acute encephalitis syndrome. In measles-endemic countries, fulminant SSPE should also be included in the list of causes of acute encephalitis syndrome.^{13,14}

Another issue is that the clinical presentation of our case is remarkably similar as seen in pediatric autoimmune encephalitis. Anti-*N*-methyl-D-aspartate receptor encephalitis is the most common autoimmune encephalitis in children. In some undiagnosed acute encephalitis syndrome cases, measles infection can be detected. Pediatric autoimmune encephalitis is characterized by rapidly progressive encephalopathy with memory loss, altered mental status, or psychiatric manifestations. Other features are new-onset seizures, focal neurological deficit, and inflammatory changes in the cerebrospinal

fluid. Abnormal movements (orofacial, limb, or trunk dyskinesias) are quite distinctive of anti-*N*-methyl-D-aspartate receptor encephalitis. Electroencephalography shows either focal, slow diffusion or disorganized activity; epileptiform discharges; or characteristic but infrequent extreme delta brush. Electroencephalography, in our case, demonstrated generalized slowing, a change that is usually seen in advanced stages of SSPE. Neuroimaging is frequently normal or may show cortical or subcortical focal signal changes. Diagnosis is considered as confirmed if the IgG antibodies against the GluN1 subunit of the anti-*N*-methyl-D-aspartate receptor are demonstrated in the cerebrospinal fluid.^{15,16}

Our case also highlights the importance of universal coverage of measles vaccination. The situation remains grim, and approximately 50% of the global measles-associated deaths occur in India.¹⁷

Is rapidly progressive SSPE (with atypical clinical features) an usual manifestation or new disease?^{13,14} This issue can only be resolved if histopathological examination is undertaken in few cases with rapid onset of SSPE.

This case highlights that acute rapidly progressive SSPE can present as acute encephalitis. Whenever there are unusual clinical manifestations and neuroimaging picture, the cerebrospinal fluid should be examined for anti-measles antibodies. Another point we want to make is that anti-*N*-methyl-D-aspartate receptor encephalitis, although is a close mimic but expensive antibody, testing should be performed after excluding rapidly progressive SSPE by cerebrospinal fluid anti-measles antibody titer estimation.

Received March 18, 2019. Accepted for publication April 17, 2019.

Published online May 28, 2019.

Note: Supplemental video appears at www.ajtmh.org.

Acknowledgment: The American Society of Tropical Medicine and Hygiene (ASTMH) assisted with publication expenses.

Disclosure: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and specific efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Authors' addresses: Ravindra Kumar Garg and Hardeep Singh Malhotra, Department of Neurology, King George's Medical University, Lucknow, India, E-mails: garg50@yahoo.com and drhsmalhotra@gmail.com. Neeraj Kumar, Imran Rizvi, Ravi Shekhar Jaipuria, Praveen Kumar Sharma, and Ravi Uniyal, Department of Neurology, King George's Medical University, Lucknow, India, E-mails: dmeera2903@gmail.com, imranrizvi09@gmail.com, jaipuriarshekhar@gmail.com, pspgimer@gmail.com, and ravi.sun.uniyal@gmail.com. Amita Jain and Danish Nasar Khan, Department of Microbiology, King George's Medical University, Lucknow, India, E-mails: amita602002@yahoo.com and microbiology@kgmcindia.edu.

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