

# Case Report

## A Case of Early Onset Subacute Sclerosing Panencephalitis Presented as Juvenile Myoclonic Epilepsy

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### ABSTRACT

A 7.5 years girl presented with myoclonic jerks with prolonged duration coming progressively at shorter intervals for last six months. There was declining academic performances. The dystonic, dyskinetic movements and ataxia were there for last three months. The stages were progressing too rapidly. IgG antibody titre to measles virus was found to be positive with EEG changes which confirms diagnosis. SSPE at so early age with atypical presentation is unique in this indexed case.

**Key words:** *Early onset, juvenile myoclonic epilepsy, measles immunization, myoclonic jerks, subacute sclerosing panencephalitis*

### INTRODUCTION

The subacute sclerosing panencephalitis (SSPE) or Dawson's encephalitis is a rare complication of measles virus (rubeola) seen in children and adolescents caused by latent mutant strain, which affects the central nervous system. In general, it is unusual to find measles virus affecting brain, and with widespread routine vaccination, the incidence has fallen to approximately 10 cases/year in the US and Western world. However, in India, the prevalence is slightly higher affecting approximately 20 cases/million.<sup>[1]</sup> The cases are uniformly fatal. The symptoms can range from altered behavior, alteration in personality, myoclonic jerks, cognitive decline,

gradual behavioral changes, and unsteady gait, ataxia, and photosensitivity to coma.<sup>[2]</sup> There may be damage to optic nerve and retina (chorioretinitis). The average latent period of SSPE is 7–10 years (range: 1 month to 27 years) after measles virus infection, and death usually occurs within 1–3 years after the onset of symptoms.<sup>[3]</sup>


### CASE REPORT

A 7.5-year-old girl presented with myoclonic jerks, gradually increasing in severity with prolonged duration, coming progressively at shorter interval for

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the past 6 months. Parents gave a history of road traffic accident 1 month back with head injury. Computed tomography scan of the brain was found to be normal during that period. The MRI showed focal cortical atrophy and generalized ventricular dilatation as shown in Figure 1. There was no developmental delay as noticed by the well-educated urban parents as well as treating pediatrician. There was no language delay or family history of seizure disorders. There was no history of GTCS or febrile convulsion in the past or any diurnal variation of presentation of symptoms. There was no deterioration of cognition prior to this episode. The index case presented with myoclonic jerks with frequent falls. There were declining scholastic performances, irritability, agitation, and temper tantrums, both in the school and home setting for the past 6 months, and then she developed jerks initially involving head later spreading to trunks and limbs. There were history of dystonic, dyskinetic movements, and ataxia has been developed gradually and getting severe for the past 3 months. The normal development till age 6 years rules out other neurodevelopmental disorders. The stages are progressing too rapidly. The parents cannot confirm whether the child has taken measles vaccine. The ophthalmological findings observed in this indexed patient are chorioretinitis, optic atrophy, and Anton's syndrome, i.e. denial of cortical blindness [Table 1].

The differential diagnosis made at this point was (i) Landau Guillaín-Barré syndrome (II) juvenile myoclonic epilepsy (JME), (iii) acute disseminated encephalomyelitis (ADEM), (iv) infective etiology (meningoencephalitis), (v) metabolic syndromes, (vi) SSPE, etc., [Table 2]. The SSPE is unlikely to start before 9 years. It is expected in the index case, and very soon, the cognitive deterioration will progress. Most SSPE patients present with ataxia and fall, and then myoclonic jerks appear. The patient is presently in Stage II and will rapidly progress to Stage III modified Jabbour classification [Table 3]. The earlier age of onset carries poorer prognosis. The anti-measles antibody is strong, but not absolute for diagnosis. The electroencephalogram (EEG) findings can change across the stages.<sup>[4]</sup>

**Investigation findings**

- Antibodies against NMDA, AMPA 1, AMPA 2, CASPR, LGI 1, and GABA B receptors are negative. The workup has been done to negate inflammatory and autoimmune etiologies. These antibodies are still now considered to be associated with refractory epilepsy, and if becomes positive, may respond to corticosteroids
- EEG shows independent bifrontal central epileptiform activities. The EEG has diffuse, slowing, high-voltage waves and periodic lateralized

epileptiform discharges (PLED). The presence of both periodic complexes and left-dominated PLED suggests grim prognosis. The EEG characterized periodic activity, and Rademecker's complex is seen. There are bilateral high-voltage (200–500 mV) polyphasic bursts with symmetrical synchronous discharges, and stereotyped delta waves are seen. The periodic complexes are coming at fairly regular interval maintaining 1:1 relationship with myoclonic jerks

- The cryptococcal capsular polysaccharide antigen (Indian ink preparation) was negative. The workup has been done to rule out

**Table 1: Diagnostic criteria of subacute sclerosing panencephalitis as proposed by Dyken**

Criteria	Detailed criteria
Clinical	Progressive subacute mental deterioration with myoclonus
EEG	Periodic high-voltage discharges
CSF	Raised immunoglobulin or oligoclonal bands
Measles antibody	Raised titer in serum (>1:256) or in CSF (>1:4)
Brain biopsy	Shows panencephalitis

Definitive: Criteria 5 with three more criteria; Probable: Any three of the five criteria. CSF – Cerebrospinal fluid; EEG – Electroencephalogram

**Table 2: Differential diagnosis of other neurodegenerative myoclonic conditions<sup>[13]</sup>**

Progressive myoclonic epilepsies (early myoclonus and generalized tonic-clonic seizures)	
	Unverricht-Lundborg syndrome
	Myoclonic epilepsy ragged red fiber
	Lafora body disease
	Neuronal ceroid lipofuscinoses
	Sialidoses
	Hereditary dentatorubral-pallidolusian atrophy
Progressive myoclonic encephalopathies (where myoclonus is generally overshadowed by other clinical manifestations)	
	GM2 gangliosidosis
	Nonketotic hyperglycinemia
	Niemann-Pick disease
	Juvenile Huntington's disease
	Alzheimer's disease
	Creutzfeldt-Jakob disease
Progressive myoclonic ataxias (seizures are either absent or late)	
	Spinocerebellar degeneration
	Wilson's disease
	Coeliac disease
	Whipple's disease

**Table 3: Modified Jabbour classification of staging of subacute sclerosing panencephalitis**

Criteria	Detailed criteria
Stage I	Mental and behavioral changes, forgetfulness, lethargy, and irritability
Stage II	Myoclonic jerks, dyskinesia, choreoathetosis, ataxia
Stage III	Decerebrate rigidity, decorticate rigidity
Stage IV	Severe loss of all cortical functions, flexion posturing of limbs and mutism

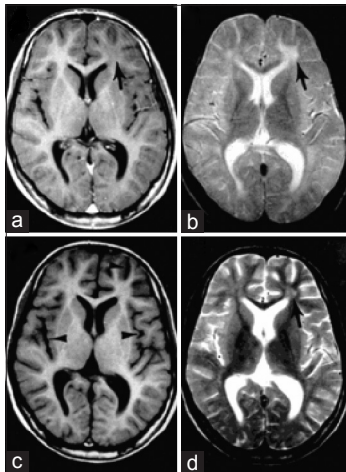
meningoencephalitis though the typical history in this case was unlikely to be infective etiology

- Finally, the titer for IgG antibodies to measles virus by ELISA in cerebrospinal fluid (CSF)-625 was found to be positive which points to the diagnosis of SSPE<sup>[5]</sup>
- Magnetic resonance imaging shows focal abnormality in subcortical white matter as well as advanced stage findings such as cortical atrophy with effacement of sulci and ventriculomegaly [Figure 1]
- The EEG findings show bi-fronto-central epileptiform activity with periodic lateralized discharges [Figures 2-4]
- The typical autopsy findings of pathological specimen in microscopy are astrogliosis, neurofibrillary tangles, degeneration of dendrites, demyelination, infiltration with inflammatory cells, and presence of intranuclear and cytoplasmic inclusion bodies (Cowdry Type A with homogenous

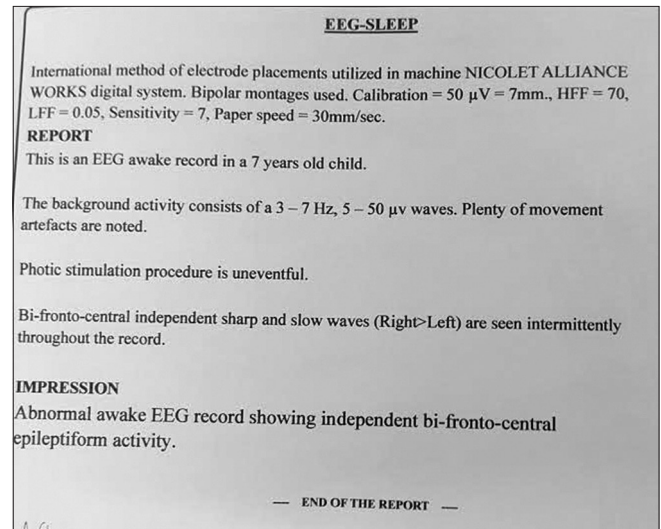
eosinophilic material and multiple, small Cowdry Type B present in the brainstem). The higher incidence of SSPE has been attributed to different methods used for detection in various studies and involvement of genotype D. The risk of contracting measles was high during the years 1989–1991, which may better reflect and explain the high incidence of SSPE in countries such as India, Turkey, and Papua New Guinea, where the incidence of measles among very young children is also very high.

## DISCUSSION

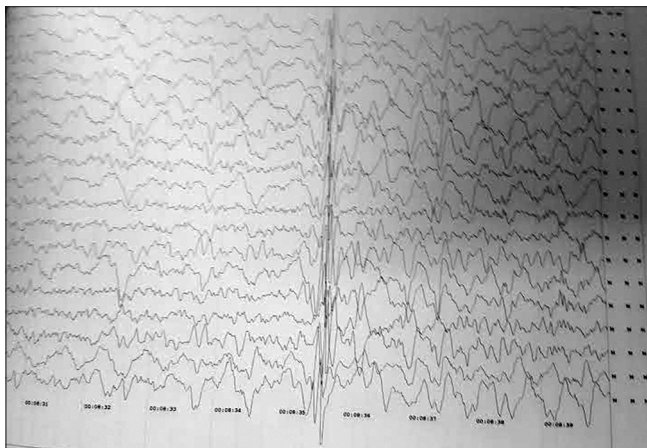
Although measles is a monotypic virus, 22 wild type of strains have been found.<sup>[6]</sup> The serotypes have endemic circulation in the specified geographic area with occasional epidemic. The vaccine virus is particularly genotype A, different from the wild type. The case load



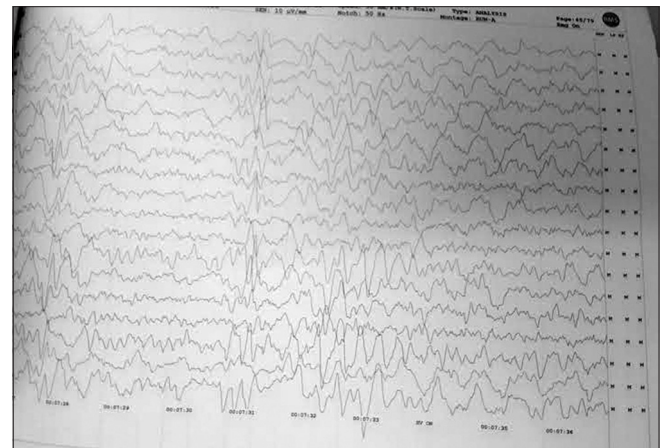
**Figure 1:** Generalized ventricular dilatation and focal cerebral atrophy. Obliteration of interhemispheric fissure and hemispheric sulci due to edema in T1 images (a and c). Alteration of signal in deep white matter, especially in occipital and frontal regions in T2 images (b and d)



**Figure 2:** Electroencephalogram report



**Figure 3:** Electroencephalogram findings showing bifrontal epileptiform discharges



**Figure 4:** Electroencephalogram showing periodic lateralized epileptiform discharges, suggesting grim prognosis

of measles has been reduced to 1–2 cases/year in 1980s from 30 to 40 cases in 1970s in the US, but there is resurgence in 1989–1991, during which 55,622 cases of measles, especially among under five children living in inner city areas with 123 measles-associated death have been reported.<sup>[7-9]</sup>

From the vignette, it looks like to be a case of complex myoclonic epilepsy, may be a case of JME, other possibilities could be progressive myoclonic epilepsy such as Lafora disease and mitochondrial encephalopathy. The case is unlikely to be Lennox–Gastaut syndrome as the age of onset and severity do not match. The myoclonic epilepsy of early childhood usually have onset at an earlier age, so this could be a remote possibility where sodium valproate and clonazepam is the treatment of choice, and if seizure remains uncontrolled, levetiracetam may be added.

JME has a typical onset at the age of 10–12 years, but usually carries a good prognosis. It has diurnal variation of symptoms, worse symptoms in early morning, and gradually decreases as day progresses. The complex myoclonic epilepsy and the progressive variety have more severe manifestations and cause progressive cognitive deterioration. It also carries a poor prognosis.

An adult case of a 33-year-old woman has been described who had encephalopathy following eclampsia.<sup>[10]</sup> A case of a 13-year-old boy with a brief history of cognitive decline, papilledema, headache, myoclonic jerks, cranial nerve palsy and neuroimaging features mimics ADEM, and pseudotumor cerebri has also been reported.<sup>[11]</sup>

In Stage I, the symptoms include forgetfulness, poor scholastic performance, temper tantrums, distractibility, and hallucinations. In Stage II or in advanced stage, there will be frequent myoclonic jerks, muscle rigidity, presence of pyramidal and extrapyramidal signs, dysphagia, and respiratory distresses due to the involvement of thoracic, respiratory muscles resulting in choking and pneumonia followed by blindness in terminal stage. The disease has “subacute” onset (mean = 9 months) with gradual progression. It generates a reaction which damages and scars the brain (sclerosing). Panencephalitis involves the entire brain. The risk factors of encountering SSPE is more among (1) male child, (2) if the measles occur before 2 years because of immune system immaturity, (3) measles infection during perinatal period, and (4) measles infection during pregnancy.<sup>[12]</sup> The pathogenesis has been explained as widespread point mutation of viral genome in clonal region where Type II transmembrane protein H mediates virus cell attachment by binding with cell surface protein CD46.

The changes in H and F protein have been attributed to persistent infection without affection of M protein.

### Management

Intrathecal interferon (IFN) beta, intraventricular IFN alpha, and oral isoprinosine have been tried without much success, and response rate varies widely. The prognostic counseling to the family members has already been given. Oral isoprinosine therapy (available in brand name immunovir) is costly to many people. The immunomodulator IFN beta, intrathecal and intraventricular IFN alpha, oral isoprinosine and antiviral intravenous ribavirin, amantadine, etc., have been tried, especially in Stage I of the disease. In Stage II, only palliative care may be offered. The combination of intraventricular IFN alpha with oral isoprinosine is currently one of the best treatments available. Panitch *et al.* were the first to use IFN alpha via intraventricular route with an Ommaya reservoir planted subcutaneously with a catheter placed inside the frontal horn of the right lateral ventricle under general anesthesia.<sup>[14]</sup>

### Prognosis

Only around 5% of the cases may have sustained spontaneous, long-term improvement. Santoshkumar and Radhakrishnan reported a case of a woman who remained bedridden for 17 months and was incapable of self-care.<sup>[15]</sup>

### CONCLUSION

The neurological complications of measles can be categorized into five types, for example, (i) postmeasles encephalitis due to autoimmune reaction seen soon after the infection, (ii) inclusion body encephalitis which develops weeks or months after measles infection due to defective cell-mediated immunity, (iii) SSPE due to persistent defective measles virus infection, (iv) postinfectious due to acute immune response, and (v) transverse myelitis which is a rare type of acute immune reaction.<sup>[16]</sup>

The diagnosis has been confirmed by measles-specific IgG antibody in CSF and blood. The part of measles virus (RNA) virus is detectable in CSF. The measles virus genotypes are determined by reverse transcriptase and polymerase chain reaction technique.<sup>[17]</sup>

Symptomatically, seizure can be controlled by sodium valproate and benzodiazepine. Spasticity can be managed by baclofen. The supportive care to family with the help of social worker and hospice is helpful. The preventive aspect is the most useful approach as measles vaccination and elimination of SSPE can be possible by global eradication of measles. The measles

vaccine-induced SSPE has not been reported. There had been an epidemic affecting 32 children in-between 2003 and 2009 in Germany. The hospitalized measles cases with codes 055 as per the ICD-9 and codes BO5 of ICD-10 had been included. A high index of suspicion and awareness are required from the part of treating physician, keeping in mind that SSPE can occur at very early age as in this case.<sup>[18,19]</sup>

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### Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Gutierrez J, Issacson RS, Koppel BS. Subacute sclerosing panencephalitis: An update. *Dev Med Child Neurol* 2010;52:901-7.
- Göbel U, Heinrich B, Krauth KA, Steingrüber HJ, von Kries R. Process and outcome quality of the German Paediatric Surveillance Unit (ESPED). *Klin Padiatr* 2010;222:92-7.
- Rota PA, Bellini WJ. Update on the global distribution of genotypes of wild type measles viruses. *J Infect Dis* 2003;187 Suppl 1:S270-6.
- Jabbour JT, Duenas DA, Sever JL, Krebs HM, Horta-Barbosa L. Epidemiology of subacute sclerosing panencephalitis (SSPE). A report of the SSPE registry. *JAMA* 1972;220:959-62.
- Chung BH, Ip PP, Wong VC, Lo JY, Harding B. Acute fulminant subacute sclerosing panencephalitis with absent measles and PCR studies in cerebrospinal fluid. *Pediatr Neurol* 2004;31:222-4.
- Bellini WJ, Rota JS, Lowe LE, Katz RS, Dyken PR, Zaki SR, *et al.* Subacute sclerosing panencephalitis: More cases of this fatal disease are prevented by measles immunization than was previously recognized. *J Infect Dis* 2005;192:1686-93.
- Campbell H, Andrews N, Brown KE, Miller E. Review of the effect of measles vaccination on the epidemiology of SSPE. *Int J Epidemiol* 2007;36:1334-48.
- Miller C, Andrews N, Rush M, Munro H, Jin L, Miller E. The epidemiology of subacute sclerosing panencephalitis in England and Wales 1990-2002. *Arch Dis Child* 2004;89:1145-8.
- Harpaz R. Completeness of measles case reporting: Review of estimates for the United States. *J Infect Dis* 2004;189 Suppl 1:S185-90.
- Garg RK. Subacute sclerosing panencephalitis. *Postgrad Med J* 2002;78:63-70.
- Panda AK, Mehta VJ, Maheshwari S, Kar SK. Subacute sclerosing panencephalitis presenting as acute disseminated encephalomyelitis and pseudotumour cerebri. *BMJ Case Rep* 2013;2013. pii: Bcr-2013-009432.
- Dyken PR. Subacute sclerosing panencephalitis. *Current status. Neurol Clin* 1985;3:179-96.
- Honarmand S, Glaser CA, Chow E, Sejvar JJ, Preas CP, Cosentino GC, *et al.* Subacute sclerosing panencephalitis in the differential diagnosis of encephalitis. *Neurology* 2004;63:1489-93.
- Panitch HS, Gomez-Plascencia J, Norris FH, Cantell K, Smith RA. Subacute sclerosing panencephalitis: Remission after treatment with intraventricular interferon. *Neurology* 1986;36:562-6.
- Santoshkumar B, Radhakrishnan K. Substantial spontaneous long-term remission in subacute sclerosing panencephalitis (SSPE). *J Neurol Sci* 1998;154:83-8.
- Nakayama T, Fujino M, Yoshida N. Molecular epidemiology of measles virus in Japan. *Pediatr Int* 2004;46:214-23.
- Barrero PR, Grippo J, Viegas M, Mistchenko AS. Wild-type measles virus in brain tissue of children with subacute sclerosing panencephalitis, Argentina. *Emerg Infect Dis* 2003;9:1333-6.
- Hinman AR, Orenstein WA, Papania MJ. Evolution of measles elimination strategies in the United States. *J Infect Dis* 2004;189 Suppl 1:S17-22.
- Orenstein WA, Papania MJ, Wharton ME. Measles elimination in the United States. *J Infect Dis* 2004;189 Suppl 1:S1-3.