RESEARCH PAPER

Developmental And Epileptic Encephalopathy With Refractory Seizures And Suppression-Burst Eeg: A Case Report

Dr. Vaduguri Rahul[1], Dr. Likhitha B[2]

[1] Post Graduate, Department of Paediatrics, Jawaharlal Nehru Medical College and KLES Dr. Prabhakar Kore Hospital & Medical Research Center, Belagavi, Karnataka, India.
Email: vadugurirahul@gmail.com
[2] MD Pediatrics, Department of Paediatrics, Jawaharlal Nehru Medical College and KLES Dr. Prabhakar Kore Hospital & Medical Research Center, Belagavi, Karnataka, India.
Email: likhitha.chander@gmail.com
Corresponding Author:
Dr. Likhitha B
Email: likhitha.chander@gmail.com

Received: 6th July, 2026; Revised: 7th July, 2026; Accepted: 7th July, 2026; Available Online: 8th July, 2026

ABSTRACT
Background:Developmental and epileptic encephalopathies (DEEs) are a group of severe neurodevelopmental disorders characterised by early-onset refractory seizures, developmental stagnation or regression, and distinctive EEG patterns. Ohtahara syndrome (early infantile epileptic encephalopathy) is the classic neonatal presentation of DEE, typically featuring tonic spasms or myoclonic seizures and a suppression-burst EEG pattern. Heterozygous mutations in the SPTAN1 gene, which encodes α-II spectrin, are a recognised cause of DEE type 5 (OMIM #613477).
Case Presentation:A male neonate born at 38 weeks gestation by lower segment caesarean section to a primigravida mother from a consanguineous marriage (birth weight 2.7 kg) presented on the first day of life with refractory seizures manifesting as myoclonic jerks involving the right upper and lower limbs along with moderate respiratory distress. EEG demonstrated a suppression-burst pattern. Cranial ultrasound showed periventricular hyperintensities, grade I germinal matrix haemorrhage and a left choroid plexus cyst; MRI brain was normal. The infant required initial ventilatory support and was subsequently managed with multiple antiepileptic drugs, ketogenic diet and supportive care including RT feeds. Whole exome sequencing identified a heterozygous missense variant c.4822G>A (p.Ala1608Thr) in exon 38 of the SPTAN1 gene, classified as a variant of uncertain significance (VUS) according to ACMG criteria (PM2, PP3) but with strong phenotypic correlation to DEE-5. No clinically significant copy number variants were detected. Parental segregation analysis was recommended.
Conclusion:This case highlights the diagnostic utility of whole exome sequencing in neonates with unexplained refractory epilepsy and suppression-burst EEG. SPTAN1-related developmental and epileptic encephalopathy should be considered in the differential diagnosis even when the variant is initially classified as VUS. Segregation analysis in parents is essential for possible reclassification and accurate genetic counselling..

Keywords: SPTAN1; developmental and epileptic encephalopathy; Ohtahara syndrome; whole exome sequencing; neonatal seizures; suppression-burst EEG; variant of uncertain significance; refractory epilepsy...
How to cite this article*:* Rahul V, Likhitha B. Developmental And Epileptic Encephalopathy With Refractory Seizures And Suppression-Burst Eeg: A Case Report. Int J Drug Deliv Technol. 2026;16(67s):1475-1476. DOI: 10.25258/ijddt.16.67s.129
Source of support: Nil.
Conflict of interest: Nil.

INTRODUCTION

Developmental and epileptic encephalopathies (DEEs) represent a clinically and genetically heterogeneous group of disorders in which epileptic activity itself contributes to severe cognitive and developmental impairment. Among the neonatal-onset DEEs, Ohtahara syndrome (also known as early infantile epileptic encephalopathy – EIEE) is characterised by early onset of tonic spasms or myoclonic seizures, a suppression-burst pattern on EEG, and profound developmental delay.

The genetic landscape of Ohtahara syndrome and related DEEs has expanded rapidly with the widespread use of next-generation sequencing. Pathogenic variants in SPTAN1 (OMIM 182810), which encodes the cytoskeletal protein α-II spectrin, are established causes of DEE type 5. α-II spectrin is highly expressed in the developing brain and plays a critical role in maintaining neuronal membrane stability, axonal integrity and synaptic function. Disruption of this protein leads to early-onset refractory epilepsy, often with a burst-suppression or suppression-burst EEG pattern, followed by evolving West syndrome or Lennox-Gastaut syndrome features and severe neurodevelopmental disability.

Whole exome sequencing (WES) has become an essential diagnostic tool in neonatal refractory epilepsies, especially when neuroimaging is non-diagnostic and metabolic

**Author for Correspondence: likhitha.chander@gmail.com*

workup is negative. Here we report a neonate with day-1 onset refractory myoclonic seizures, suppression-burst EEG and a heterozygous SPTAN1 variant of uncertain significance that shows strong phenotypic correlation with DEE-5.

CASE PRESENTATION

A male infant was born at 38 weeks gestation by elective lower segment caesarean section to a primigravida mother from a consanguineous marriage. Birth weight was 2.7 kg. There was no history of perinatal asphyxia. From the first day of life the baby developed recurrent seizures characterised by myoclonic jerks predominantly involving the right upper and lower limbs, associated with moderate respiratory distress.

Initial management included intravenous fluids, multiple antiepileptic drugs and respiratory support with continuous positive airway pressure/oxygen. EEG performed in the neonatal period revealed a suppression-burst pattern consistent with severe epileptic encephalopathy. Cranial ultrasound demonstrated periventricular hyperintensities, grade I germinal matrix haemorrhage and a left choroid plexus cyst. MRI brain was reported as normal with no evidence of structural malformation, cortical dysplasia or significant atrophy.

The infant was gradually weaned off respiratory support. Seizures remained refractory despite multiple antiepileptic medications; ketogenic diet was initiated and supportive care with RT feeds was continued. At one month of age, whole exome sequencing was performed (MedGenome Labs, sample collected 6 February 2025). The test identified a heterozygous missense variant in exon 38 of SPTAN1: c.4822G>A (p.Ala1608Thr). The variant was absent or extremely rare in population databases and predicted to be damaging by multiple in silico tools. It was classified as a variant of uncertain significance (VUS) per ACMG guidelines (evidence codes PM2, PP3). No significant copy number variants were detected. An incidental homozygous VUS was noted in BSND (associated with Bartter syndrome type 4a) but did not correlate with the clinical phenotype.

Parental testing for segregation analysis was recommended to confirm whether the variant was de novo or inherited and to potentially reclassify its significance. At the time of reporting, the infant continued on multiple antiepileptics and ketogenic diet with ongoing developmental concerns.

DISCUSSION

The clinical presentation of day-1 onset refractory myoclonic seizures, suppression-burst EEG and normal MRI in this neonate is highly suggestive of an early infantile developmental and epileptic encephalopathy, most consistent with the Ohtahara syndrome spectrum. The identification of a heterozygous SPTAN1 variant with strong in silico predictions and phenotypic match supports this diagnosis, even though the variant is currently classified as VUS.

SPTAN1 mutations are known to cause a spectrum of phenotypes ranging from classic Ohtahara syndrome to West syndrome and later-onset epileptic encephalopathies with developmental delay. The p.Ala1608Thr variant lies within a conserved spectrin repeat domain and is predicted to disrupt protein function. While functional studies or additional segregation data would allow reclassification, the combination of the specific EEG pattern, age of onset, refractoriness and developmental trajectory provides compelling clinical correlation.

Important differentials for neonatal burst-suppression/suppression-burst EEG include early myoclonic encephalopathy (often metabolic), glycine encephalopathy, pyridoxine-dependent epilepsy, and other genetic DEEs (ARX, STXBP1, KCNQ2, etc.). The normal MRI and absence of typical metabolic markers in this case favoured a primary genetic aetiology, which WES efficiently identified.

This case also illustrates the practical challenges of reporting variants of uncertain significance in clinical exome sequencing. The ACMG framework requires additional evidence (segregation, functional studies, or new literature) before upgrading classification. Until such data are available, management remains phenotype-driven, with emphasis on seizure control, developmental support, and genetic counselling regarding recurrence risk (up to 50% if de novo vs lower if inherited).

Early genetic diagnosis, even when initially VUS, allows realistic prognostic counselling for families and guides decisions regarding intensity of care, palliative measures, and future reproductive options.

CONCLUSION

We report a neonate with refractory epilepsy and suppression-burst EEG harbouring a heterozygous SPTAN1 variant of uncertain significance with strong phenotypic correlation to developmental and epileptic encephalopathy type 5. Whole exome sequencing proved invaluable in establishing a molecular diagnosis in this case of unexplained neonatal epileptic encephalopathy. Parental segregation analysis is strongly recommended to facilitate variant reclassification. This case adds to the growing literature on SPTAN1-related DEE and underscores the importance of phenotype-driven interpretation of genetic findings in paediatric neurology practice..

REFERENCE

N\A.