Unexpected seizure outcome in two cases of milder spectrum of SCN1A

Dr. Abinaya Seenivasan[1], Dr. Deivasumathy Muthugovindan[2]

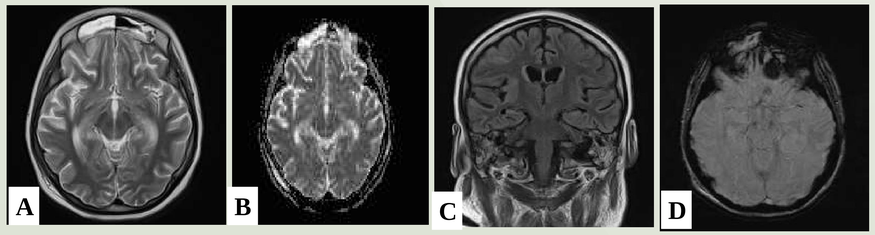
1 Paediatric Neurology Trainee, 2 Paediatric Neurology Consultant, Royal Manchester Children's Hospital, United Kingdom

18TH ICNC 2024 Footprints to the future INTERNATIONAL CHILD NEUROLOGY CONGRESS Cape Town, South Africa I May 6-10, 2024

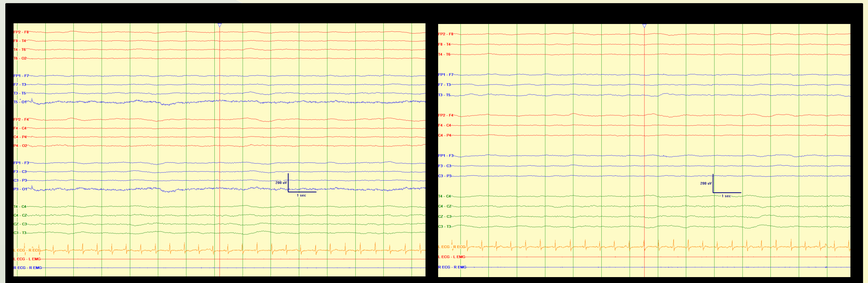
Background: The SCN1A gene is the most common clinically relevant epilepsy gene with more than 1700 variants identified from epileptic to non-epileptic conditions. We present 2 cases with milder clinical spectrum who went on to have significant brain injury following a prolonged seizure.

Case 1: Our first case is a 13-year-old girl who presented with refractory status epilepticus following a vacation in a beach during summer. She was born to non-consanguineous parents and presented with first episode of seizures at 6 months of age and was further diagnosed with missense mutation of SCN1A gene (c.2619G>T:T.r.p873Cys) around 5 years. She was started on sodium valproate at 5 years and was maintained on monotherapy for several years. She had occasional seizures with fever and did not require any rescue medications.

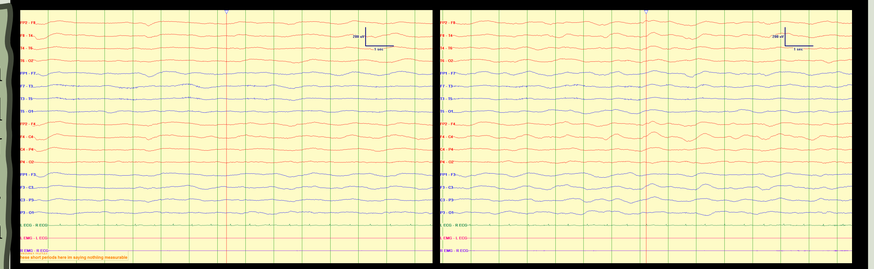
Overall, she had about 6 seizures until 13 years of age when she presented with prolonged refractory status epilepticus. During this time, she was on vacation in Spain in hot weather which triggered her seizures. She was admitted to local hospital in spite of 3 rescue medications. She continued to have seizures and then was transferred to PICU. She required IV anaesthesia and prolonged period of intubation and ventilation. She had sustained significant hypoxic brain injury with MRI showing extensive ischemia of right hemisphere, left frontal region and right basal ganglia. She is left with significant neurological sequelae, unable to speak, walking with support and needing help for everyday events.

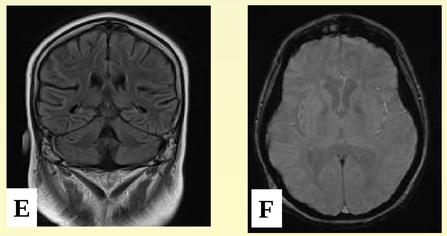


A-D: MRIs of Case 1. Focal areas of low susceptibility seen in right caudate and putamen showing haemorrhagic changes of ischaemic evolution predominantly bilateral MCA territory. B. Residual diffusion restriction from previous scans. Generalised cerebral atrophy.



EEG of case 1 above and case 2 below. Both EEGs were done when the girls were in PICU under sedation- intubated and ventilated under anaesthesia showing generalised slow activity and no changes throughout.





E-F: Mild attenuation of M1 segments of both MCA and supraclinoid segments of both ICA. Similar findings in Case 2.

Case 2:

We had a similar child presenting at 14 years of age with controlled seizures for many years and then sustaining a profound hypoxic injury following a prolonged seizure necessitating PICU admission. She had a missense de novo mutation of SCN1A gene. Her progress was slow following the event leaving her with serious neuro disability.

Discussion: Our case series show that even children with good control of seizures need to be monitored and prescribed for rescue medication early on. The manifestations of epilepsy due to mutation in SCN1A can be a varied spectrum and more phenotypes need to be understood.

Conclusion: Long term follow up is needed to understand the change in seizure pattern especially the ones in the milder spectrum.

References: 1. Kluckova D, Kolnikova M, Lacinova L, Jurkovicova-Tarabova B, Foltan T, Demko V, Kadasi L, Ficek A, Soltysova A. A study among the genotype, functional alternations, and phenotype of 9 SCN1A mutations in epilepsy patients. Scientific reports. 2020 Jun 24;10(1):10288. 2. Ding J, Li X, Tian H, Li W, Wang F, Sun T. SCN1A mutation—beyond Dravet syndrome: a systematic review and narrative synthesis. Frontiers in Neurology. 2021 Dec 24;12:743726. 3. Scheffer IE, Nabbout R. SCN1A-related phenotypes: epilepsy and beyond. Epilepsia. 2019 Dec;60:S17-24.

Acknowledgements: Dr Dan Hindley, Consultant paediatrician, Alderhey Children's Hospital, United Kingdom