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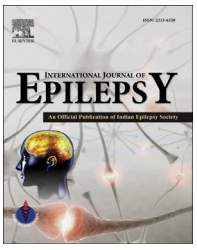

Review Article

Neonatal seizures and epilepsies

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ABSTRACT

Neonatal seizure is the most frequent clinical manifestation of central nervous system dysfunction in the newborn. It is defined as a *paroxysmal alteration in neurologic function that include motor, behavior and/or autonomic functions occurring in the first 28 days after birth of a term neonate or before 44 weeks of gestational age in a preterm infant*. Seizures in the presence of encephalopathy are the most important clinical pattern of an acute cerebral insult in the immature brain. Chronic epileptic disorders very rarely may have their onset in the neonatal period and may persist well into infancy and later childhood. Structural brain defects and metabolic disorders constitute a substantial proportion of this group. Ictal EEG recordings remain the gold standard for the accurate identification of neonatal seizures of cortical origin and for the distinction from non-epileptic paroxysmal events. This review focuses on the electroclinical patterns of neonatal seizures and epilepsies with an emphasis on the classification and terminologies. The current therapeutic options are also highlighted briefly.

1. Case 1

A baby boy was delivered at term following a prolonged labor. He had significant fetal distress and the Apgar was 5 at 1 minute. He was resuscitated and transferred to the Neonatal Intensive Care Unit (NICU) for ventilator support. He continued to be lethargic with poor cry and started showing abnormal stereotyped movements on the 2nd day of life. Metabolic evaluation was noncontributory. Electroencephalogram (EEG) showed burst suppression pattern (Fig. 2). Magnetic Resonance Imaging (MRI) of the brain on the 6th day of life showed features suggestive of hypoxic ischemic encephalopathy. He was treated with phenobarbitone and the seizures got controlled over the next 72 hours. He was discharged on the 10th neonatal day. There was no recurrence of seizures and phenobarbitone was tapered and stopped after one month. On follow up at 3 months, he had not attained head control or social smile. There was mild spasticity of the limbs.

Neonatal seizures are the most frequent clinical manifestation of central nervous system dysfunction in the newborn with an approximate incidence 1.8–3.5/1000 live births.[1] Seizures with encephalopathy as described in case 1 form the

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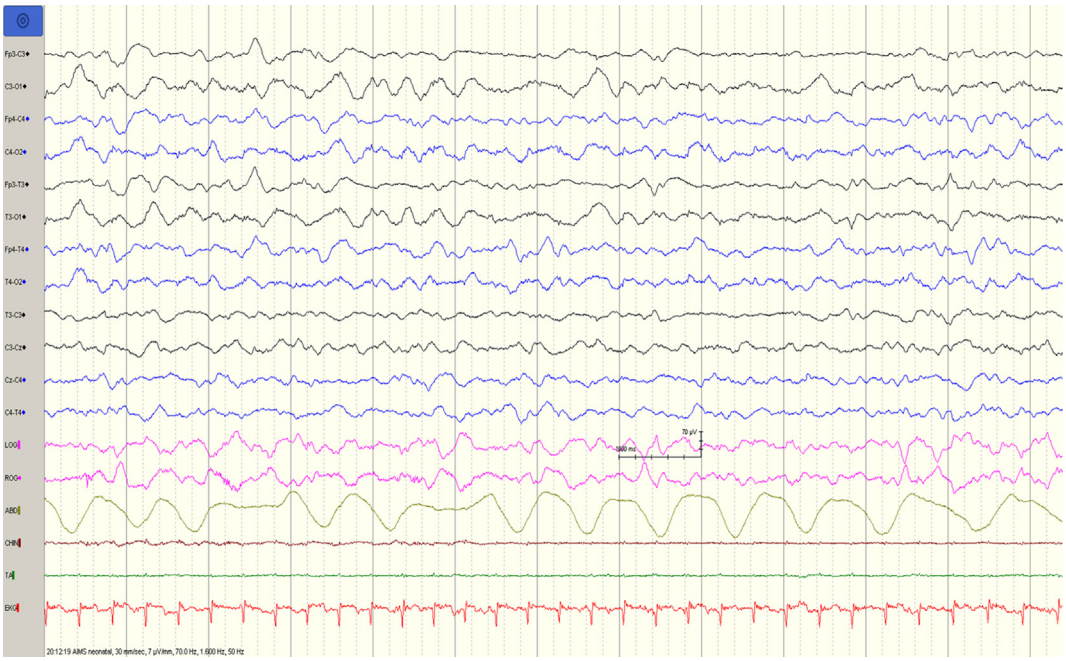

Fig. 1 – Normal EEG of a ten day old term newborn boy in the modified neonatal montage. EEG channels are organized as initial 8 channels showing longitudinal derivations and the next 4 channels showing transverse derivations. Extra cerebral channels include electrooculograms, limb and chin EMGs, abdominal movement and EKG. (Paper speed 30 mm/s, high frequency filter 70 Hz, low frequency filter 1 Hz, Notch filter 50 Hz, 7 μV/mm).

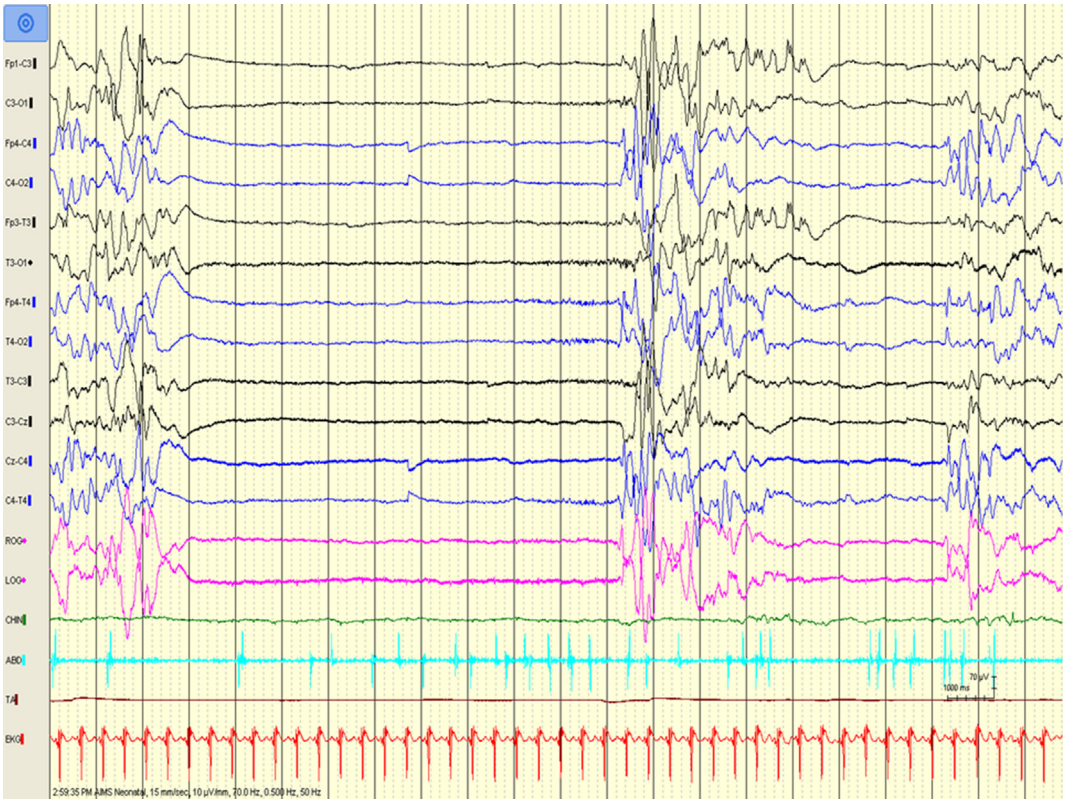

Fig. 2 – Term newborn with severe hypoxic ischemic encephalopathy associated with neonatal seizures. EEG in the modified neonatal montage shows suppressed electrical activity with frequent generalized bursts of high amplitude sharp and slow waves (suppression – burst pattern) indicating a severe brain insult. Note that the paper speed is 15 mm/s to better appreciate the suppression – burst pattern (High frequency filter 70 Hz, Low frequency filter 0.5 Hz, Notch filter 50 Hz, 10 μV/mm).