

Role of short duration, outpatient video EEG monitoring in children

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Background and Objective: Video-electroencephalographic (VEEG) monitoring is an essential diagnostic and management tool in children with epilepsy. Inpatient, long-term VEEG has tremendous advantages but may be inconvenient due to cost of hospitalization, availability of well trained staff for 24 hours and additional stress to families of patients with epilepsy. Few studies have assessed the role of short term, outpatient VEEG in children. This study was done to investigate the role of short-term, outpatient, VEEG monitoring in classifying seizure types, differentiating non-epileptic events and localizing seizure onset.

Methods: This retrospective, observational study over one year analyzed children referred for VEEG to electrophysiology department of a pediatric hospital. VEEG was done by 16 channel, digital, VEEG-monitor (NicoletOne clinical EEG system, Viasys Healthcare). A close relative was present during recording to confirm that the events were typical. The data was reviewed by neurologist and seizures were classified according to ILAE classification.

Results: Forty one children, ages 43 days to 13 years, were divided in 3 groups based on indication for VEEG: Group I: Doubts about epilepsy diagnosis and classification (n=23); Group II: Differentiation with non-epileptic events (n=15); Group III: Pre-surgical evaluation (n=3). Average duration of VEEG was 72.4 minutes (range 10 to 300 min).

Clinical events were recorded in 28 patients (68.2 %). Two or more events were recorded in 18 patients (44%). In Group I, new diagnosis was made in 4 patients: Startle epilepsy (1), hyperekplexia (1) and epileptic encephalopathy (2). Seizure reclassification was achieved in 2 patients (partial onset of GTC, startle epilepsy in myoclonic jerks). Reconfirmation of diagnosis was achieved in 2 patients. Epilepsy syndromes were diagnosed in 7 patients. Three were new diagnosis: JAE (1), LGS (1), West syndrome (1), and 4 were reconfirmation: LGS (1), West syndrome (3). No events were recorded in 8 patients. In Group II, 11 patients had events recorded, non-epileptic (7) and epileptic (4). In Group III, localization of epileptic focus was achieved in 2 patients while the third was recommended prolonged VEEG monitoring.

Modification of therapy was achieved in 21 patients (51.2%). This consisted of ketogenic diet (5), change in drugs (4), starting antiepileptic drugs (2), discontinuing medications (4) and modification of dosage (6). New neuroimaging studies were recommended in 3 patients.

Discussion: Short duration, outpatient VEEG led to major changes in diagnosis and management of epilepsy patients. It was convenient for families and cost effective. Event detection of 68% was comparable to other studies, 77% by Srikumar *et al*¹, 62.2 % by Al-Qudah *et al*.² It was very helpful in diagnosing non-epileptic events and changed the further management of the patients.

Factors affecting the success rate of EEG are duration of recording, seizure frequency and type. Higher yield of events in shorter recordings may be due to inclusion of patients with frequent seizures. Absences and non-epileptic events are more frequent than GTCs.

Conclusion: Short term, outpatient, VEEG is useful for investigating epilepsy children with frequent episodes. It is helpful in classifying seizures, identifying syndromes and modifying treatment options. It is cost effective and convenient, hence of major considerations in developing countries. It is also a resource for teaching.

References

1. Srikumar G, Bhatia M, Jain S, Maheshwari MC. Usefulness of short term video EEG monitoring in children with frequent intractable episodes. *Neurol India* 2000; 48; 29-32.
2. Al-Qudah AA, Abu-Sheikh S, Tamini AF. Diagnostic value of short duration outpatient video electroencephalographic monitoring. *Pediatr Neurol*1999; 21(3); 622-5.