Video-ambulatory EEG in a secondary care centre: A retrospective evaluation of utility in the diagnosis of epileptic and nonepileptic seizures

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Introduction

Long-term electroencephalography (EEG) is an established investigation for patients with paroxysmal clinical events raising the diagnostic possibility of epilepsy2. Due to demand on inpatient video-telemetry services, ambulatory EEG (AEEG) has been suggested as a cost-effective, more widely available alternative, although does have several important limitations3. The development of video recording alongside AEEG (video-AEEG) has received increasing attention over the last few years because of its potential to further improve diagnostic utility4. Here we present a retrospective service evaluation of an outpatient AEEG service using video-recording in a secondary care centre.

Aims

1. To assess the diagnostic utility of video-recording alongside AEEG in a large group of patients referred to a neurophysiology department.
2. To identify potential difficulties and areas for improvement with implementation of this service.

Methodology

101 video-AEEG studies were performed over a 20 month-period, with regional referrals coming from neurology (N=75), paediatric neurology (N=17), neuropsychiatry (N=7), neurorehabilitation (N=1), and stroke medicine (N=1). Referral criteria stipulated that patients experienced at least two clinical events per week. After exclusion of 13 studies, 88 video-AEEG studies (on 87 patients) were included in final analysis.

Key Results

1. 59/88 studies (67.0% of the total) provided diagnostically useful information
2. A typical clinical event occurred in 55 studies (62.5%), with an event recorded on video in 26 of the 50 studies in which video-recording was attempted (52.0%)
3. Of the 36 patients diagnosed with nonepileptic seizures (36), use of video-AEEG allowed 14 to be classified as having a “documented” diagnosis
4. 96.2% of studies where an event was seen on video influenced subsequent management decisions
5. 4 patients in the “possible” nonepileptic seizures category were referred for IVT, compared to 0 patients in the “documented” nonepileptic seizures category
6. The most common reasons for failure to successfully record an event were the camcorder not being activated by the patient or guardian (N=14), the patient being out of view or obscured (N=5), or the patient refusing consent (N=5)
7. Technical difficulties with equipment or artefacts were rarely encountered, and did not result in any events being uninterpretable

Video-Ambulatory EEG Recording

- XITEK 32-channel recording system with electrode placement as per the International 10-20 system
- Electrodes secured using colloidon +/- head net
- Patients received a letter detailing test procedure and were further counselled by a senior clinical physiologist
- Utilised clinical diary and event marker requiring patient activation
- Patients returned every 24h for battery change, electrode check and download of data
- Video recording was performed with an off-the-shelf integrated Trex HD/XITEK USA camcorder

Conclusions

- Diagnostic yield of 67.0% is consistent with previous reports of AEEG
- Addition of video-recording allows increased diagnostic confidence, particularly of nonepileptic seizures
- In a secondary care setting, this has implications for confident early diagnosis and managing referrals for tertiary centre investigation
- Continuous video-recording improves the success rate of recording a clinical event
- Improvements in patient education and training for use of video-recording may improve the number of events recorded on video

References: