



An audit on quality of request letters for electroencephalography interpretation sent to Clinical Neuroscience Centre, Faculty of Medicine, Galle

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Abstract

To analyze the quality of requests for reporting of adult electroencephalographs (EEG) and the quality of EEG records. An audit on request letters and printed records of adult EEGs sent to the Clinical Neuroscience Centre (CNC), Department of Medicine, Faculty of Medicine, Galle for reporting. A regional tertiary care centre in Sri Lanka. Fifty six consecutive EEG records with request letters sent for reporting. To evaluate the relevance of the requests, adequacy of the information given in the request for reporting and the quality of the records and to make suggestions for improvement if necessary. Indications were mentioned in 54 (96.4 %) of the patients but adequate details of the clinical condition were mentioned only in 42 (75%). The duration of the illness was mentioned in 23(41%) %; age in 21(37.5%) and the drug history in 10 (18%). Average duration of the record is 7.15 (range 2.21-13.03) minutes. Artifacts were found in 11 (19.6%) of records. Most of the letters requesting EEG reporting are lacking useful clinical details. The longer records of EEG with attention to minimize artifacts and more detailed structured request letters may improve the yield of detecting abnormalities and the quality of the reports.

Keywords: electroencephalography, audit, Sri Lanka

Introduction

EEG is a useful investigation to support diagnosis of seizure disorders, dementia and encephalopathies. EEG is freely available to clinicians in most of the tertiary care centers in Sri Lanka. Many hospitals now use digital EEG machines. These machines record the electrical activity of the cerebral cortex over the scalp electrode and store them in digital form and reconvert in to familiar graphical format for easy interpretation by the specialist who report on the record. Digital EEG machines save space and paper, cheap to run and have the advantage of easy retrieval and storage. It gives an opportunity to review EEG data in different formats e.g. different extrapolation of montages and other advantages like facilities for brain mapping, artifacts detection and removal.

As epilepsy is a paroxysmal disorder the EEG changes also appear randomly at different times. Therefore a longer EEG record is more likely to give higher detection rate of epileptiform abnormalities. Ideally the specialist who interprets the EEG should screen the whole record and come to a conclusion on the diagnosis. Due to practical difficulties in low resource setting many hospitals in Sri Lanka, the

representative pages printed by the technicians are sent for reporting. Some of the artifacts produce by the patient or external factors may be confused with epileptiform discharges. Hence minimizing, detection, correction and marking the artifacts in the records will improve the accuracy of the interpretation.

Current practice

Current practice of EEG in many of the EEG units in Sri Lanka with digital EEG machines is for the technician to record the EEG on a request of a specialist or non specialist doctor. There is no formal request form in some hospitals. After recording, the recordist print few "representative" or "abnormal" pages selected by him/her and send back to the unit from which the request was made. The number of pages printed is limited by available time and paper. In most cases the specialist caring the patient get a report from the specialist Neurologist or Neurophysiologist.

Audit and subsequent actions had shown to improve the yield of EEG abnormalities and time saving. In 1995 Nicolaidis et al reported that two fifths of requests for EEGs in general paediatrics are

inappropriate and 50- 60% was to diagnose or exclude epilepsy. Binnie observed that 60% of referrals to a specialist epilepsy centre were “routine EEG to assess control” in patients with epilepsy. When referral policy was changed the proportion of routine procedures fell to 15% and influenced management. (Binnie 1990, Binnie 1994, Nicolaides 1995). The freed technical capacity was used to expand telemetry services. It is well known that accurate clinical details are essential for correct interpretation of EEG. In Sri Lanka the saved time can be used to perform longer records.

Following the audit done on paediatric EEGs in Teaching Hospital Galle (THG) more machines had been purchased for longer records which are directly reported by Neurologist and introduction of a formal EEG request form in THG. An evaluation of digital EEG records and request for EEGs of paediatric patients had been done previously at EEG Department, Teaching Hospital, Galle (Pathirana & Navarathne 2005), but an audit on adult EEGs had not so far been done in Sri Lanka.

Materials and Methods

We collected available data from 56 consecutive request letters, which were sent together with EEG printouts to the Clinical Neuroscience Centre for specialist's opinion on EEG, from August 2006 to December 2008. The following data were collected: Indications for requesting a report, adequacy of details given as decided by the reporting neurologist on predetermined guidelines, details of the attack when applicable, duration of the illness and the timing of the last attack and the details about medication. The EEG pages sent were evaluated to obtain the following data: duration of the record, number of pages printed, presence of artifacts. Descriptive statistics were used.

Results

Audit on request letters for reporting

Indications for requesting EEG reporting were; epilepsy / seizure or suspected seizure disorder 37(66%), followed by syncope / loss of consciousness 7(12.5%), headache 4 (7.1%) and encephalitis 3 (5.35%). Dementia, aggressive behavior and right upper limb weakness was mentioned once each. Two (3.6%) request forms had illegible information.

Although indications were mentioned in 54 (96.4 %) details of the clinical condition documented are considered adequate only in 42 (75%). The duration of the illness was given only in 23(41%) request letters. Only 10 (18%) carried information regarding

medications. Nature of the seizure attack/s was described in 20(54%) records but time of the last attack was mentioned only in 5(13.5%). Age was mentioned in 1(37.5%). However the age could be calculated in all from the date of birth entered by the technician.

The expectation of the clinician, whether it is to confirm diagnosis, classification, looking for underlying cause or for control was mentioned only in few request letters. The consultant or senior registrar had signed most of the request letters, but in 5 (9%) the designation was not mentioned.

Audit on EEG records

We analyzed 56 EEG printouts sent for reporting for its length, number of pages printed and presence of artifacts. The mean length of the record was 7:15 minutes and range was 2:21 minutes to 13:03 minutes. The median number of pages printed was 5. No additional technical data were written in the records. Artifacts were found in the printed pages in 11(19.6%) records.

Discussion

We have found that request letters sent were of reasonable quality although there were few important deficiencies like lack of information on clinical problem or question, date of last attack and medication. One important deficiency was that the clinical question was not clearly mentioned in most of the letters. In this audit we found that there are opportunities for improving the EEG services in regional tertiary care centres in both aspects of audit. Training non-specialists can improve use of EEG for justifiable indications. Use of structured request forms with a cage for clinical question should be adopted to select appropriate patients for EEG. It has been found that such measures reduced the number of inappropriate requests for EEGs (Heath J, et al 2001, Nicolaides P et al 1995) Training the proper preparation of scalp for doctors and nurses can minimize the artifacts to some extent. EEGs during wakefulness should be encouraged as far as possible.

The problems of shorter record length can be improved by reducing the number of inappropriate requests for EEGs. However the technical staff needs training on the need for lengthy records, upgrade the knowledge on detection and correction of artifacts and the need to enter the patient's data properly. Their ability to detect abnormal pages should be reviewed and updated if necessary. Another solution for shorter

printouts would be for specialists to report on the screen, as is the ideal with digital EEGs. This can be realized only if an adequate number of specialists are available. A possible low cost solution is to purchase reporting software and the full record to be stored in a compact disc.

Conclusions

The current practice of recording and interpretation of EEG in some of the hospitals in Sri Lanka is not in keeping with the accepted standards of practice due to lack of resources. The request letters for interpretation also need improvements. Structured request forms for EEG recording and interpretation will improve the quality of EEG report and may give more time for each record and give more clinically relevant reports. However the ideal solution will be making more machines available, train more technician and specialists so that longer records with minimal artifacts screened fully by the specialist is possible.

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