

The Usefulness of the EEG in Aiding the Diagnosis of Seizure Disorder : Salmaniya Medical Centre Experience

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ABSTRACT

The objective of the study was to determine the sensitivity of the electroencephalography (EEG) machine in Salmaniya Medical Centre (SMC) EEG unit to detect abnormalities commonly associated with seizure disorder.

The EEG records of a clinically diagnosed group were compared to a doubtful group, mainly for the presence of abnormalities highly suggestive of seizure disorder. The obtained results were comparable to the known figures from other centres.

The EEG is the most important tool in making the distinction between seizures and other conditions. The most reliable evidence of the occurrence of a seizure is close observation of the attack and ictal epileptiform discharge. The presence of interictal epileptogenic abnormalities and the response to antiepileptic medication should be considered as suggestive and non-conclusive to the presence of a seizure disorder.

EEG is an highly individual phenomenon, as it varies in the same healthy subject during the time of recording^{1, 2}. It has been shown that the EEG may be normal in the presence of organic brain diseases, especially if the lesion is deep, small or old. It is also abnormal in 10-15% of the normal population^{3, 4}. It is not uncommon for abnormalities, usually seen in association with epilepsy, to be seen in people who have never had epileptic attacks or as a manifestation of brain damage⁵. Therefore, the EEG should be interpreted in the context of the clinical picture and never as a substitute for it. Besides diagnostic value, EEG was found to be an important prognostic

aid in neonatal convulsion. The majority (86%) of infants with normal neonatal EEG were normal, while only few (11%) of those with multifocal tracings were normal at the age of 4⁶.

The EEG unit, SMC, is the only EEG service in Bahrain. The unit receives nearly 700 referrals annually. In this study an attempt was made to validate the usefulness of the EEG in the diagnosis of seizure disorders among cases referred to SMC.

METHODS

The EEG records of all cases diagnosed or suspected to have seizure disorders referred to the EEG unit, SMC, during the period January-June 1985 made the study sample 178 cases. Cases with seizures associated with fever were excluded. The diagnosis of seizure disorder was clinically reached in 126 cases and was doubtful in 52. The records were examined for abnormalities indicative of epileptiform activity. The criteria for selecting epileptiform activity was limited to spikes and sharp transients (with or without a slow wave component) that can be clearly detected above the background rhythm^{4, 7}. The findings were compared with the clinical diagnosis in each case. The effect of antiepileptic medication on the EEG of the diagnosed group (21 cases) was evaluated.

RESULTS

Epileptiform discharges were present in 75 cases (60%) of the clinically diagnosed seizure disorders as compared to only 13 (25%) of the suspected cases. Interictal sharp or spike discharges were absent in 40% of the diagnosed cases. Those who were on regular antiepileptic medications (21 cases), had a greater incidence of EEG abnormalities (85%).

DISCUSSION

The results obtained in this study reflect mainly the function of the EEG unit in SMC and not the

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usefulness of this investigative test, which is a known fact. The unit operates an 8 channel routine recording procedure only. This reduces the effectiveness of the procedure in detecting abnormalities, especially if the affected area of the brain is small or deep. The percentage of the normal records in the clinically diagnosed group for seizure disorder (40%) is comparable to the known figures^{8, 9}. The presence of more abnormalities in the recordings of the diagnosed group, compared with the suspected group, supports the usefulness of the EEG in aiding the diagnosis. A greater incidence of abnormalities was found among the clinically diagnosed cases who received antiepileptic medication. This might be explained by the assumption that such a group constitutes a more severe type, or that the seizures were secondary to a detectable brain damage. The cases which presented with abnormalities suggestive of seizure disorder in the suspected group need further close follow up to determine the nature of the seizures. Needless to say the EEG is only valuable when its results are considered in relation to the history and the clinical examination of the patient.

CONCLUSION

The EEG unit in SMC, receives approximately 700 referrals per year. The majority are for reasons associated with the diagnosis of seizure disorder. Although the usefulness of the EEG as an aid to the diagnosis of seizure disorder is a confirmed fact, this has not been tested in Bahrain with consideration to the limitations of the unit's machine and the type of recording used. Also, such an exercise would be useful in initiating a series of research in the future.

The figures obtained, regarding epileptogenic abnormalities, are within the ranges reported from different centres. It was found that the results needed to be retested in comparison to a normal group. Such a step is impractical at present but could be done at a later stage.

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