ELECTROENCEPHALOGRAPHIC CLASSIFICATION OF EPILEPSY
IN ACCRA

BY

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Summary

The electroencephalograms (EEG) of 190 epileptics in Accra were reviewed. Focal epilepsy was found in 50% of the cases and of these the commonest site was in the temporal lobe. Temporal lobe epilepsy was present in 37.4% of all the cases. 46.3% of patients suffered from generalized epilepsy. Petit mal is confirmed as a rarity in African epileptics. A male preponderance is noted in this series, as reported by other authors.

Key Words: Epilepsy, Electroencephalogram, Ghana.

Introduction

Although prevalence studies of epilepsy have not been undertaken in Ghana, it would appear to be the commonest neurological condition seen in Accra, like in many other black African countries. The classification of epilepsy in Africa in the past has been largely based on a clinical impression. Osuntokun et al. and Osuntokum and Bademosi based their classification of the epilepsies in Nigeria on an electroencephalographic (EEG) findings. This paper seeks to classify the epilepsies in Accra on an EEG basis.

Patients and Methods

The study was done at the EEG Unit of Korle Bu Teaching Hospital, Accra. The EEG was done with a 12-channel Hellige Neuroscript 112. Stick-on electrodes were used according to the 10-20 system of the International Federation. Chart speed was 30mm per second, gain was set at 50 microvolts per second, time constant 0.3 second and high frequency filter at 70 Hz. Provocation techniques included hyperventilation and photic stimulation. Sleep recordings were done only on a few occasions; sleep was induced by oral diazepam. Patients or guardians were given an explanation of the provocative tests and their consent obtained.

The patients included all those referred for EEG for recurrent convulsions, regardless of age. Single convulsive episodes, febrile convulsion, or fits complicating generalized medical conditions like malaria, encephalitis, meningitis, anaemia, uremia, hepatic and alcoholic encephalopathy, and head trauma were excluded.

For easy comparability with the Nigerian series the criteria for abnormality adopted by Osuntokun et al. were slightly modified and adopted, namely:

a. High voltage sharp waves, spikes, or spike and wave complexes appearing in paroxysmal discharges against a normal background.

b. Paroxysmal slow-wave (theta or delta) forms with a normal background.

c. Widespread slow-wave complexes forming the background activity.

d. The EEG was classified as “centrencephalic” if the paroxysmal synchronous discharges were bilateral and symmetrical. This type was further subdivided into:

i. Petit mal, if the classical three per
second spike and wave forms were present.
ii. Hypsarhythmia.
iii. Generalized, with other wave forms

e. EEG abnormalities were classified as focal, if
i. phase reversal occurred over definite sites.
ii. marked asymmetry in amplitude occurred.
iii. Abnormal signals such as slow delta and/or theta complexes, sharp waves, spikes and polyspikes were localized over a hemisphere whether or not secondary centrencephalic propagation was observed. When the focus was in the temporal lobe, temporal lobe epilepsy was diagnosed. The focal abnormalities in other areas were grouped together.

The study was in conformity with the requirements of the Ethical Committee of Korle Bu Teaching Hospital.

Results

A total number of 190 epileptics was analysed, 112 of these were male and 78 were female. The ratio of male to female is 3:2 showing a male preponderance.

Their ages ranged from 8.3 years to 74 years. Figure 1 shows the age distribution and Figure 2 illustrates the diagnosis of the various types of epilepsy seen.

![Age Distribution](image)

Age in 5-year periods.

Fig. 1 Age Distribution of Epileptics in Accra

<table>
<thead>
<tr>
<th>EEG Diagnosis</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>190</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Generalized</th>
<th>Petit Mal</th>
<th>Hypsarhythmia</th>
<th>Temporal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number</td>
<td>88</td>
<td>4</td>
<td>3</td>
<td>71</td>
<td>24</td>
</tr>
<tr>
<td>Males</td>
<td>50</td>
<td>3</td>
<td>2</td>
<td>39</td>
<td>18</td>
</tr>
<tr>
<td>Females</td>
<td>33</td>
<td>1</td>
<td>1</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>% of Total</td>
<td>46.3</td>
<td>2.1</td>
<td>1.6</td>
<td>37.4</td>
<td>12.6</td>
</tr>
</tbody>
</table>

Table 1: EEG diagnosis of Epilepsy in 190 patients in Accra

Most remarkable is the number of temporal lobe epilepsy seen. This type of focal epilepsy accounts for 37.4% of cases. When this is combined with the other types of focal epilepsy, they account for 50% of all cases of epilepsy seen in this series.
Discussion

Various workers\(^1\text{-}^4\) have shown a male preponderance among epileptics from Black Africa. This phenomenon is confirmed in this study. An explanation advanced for this phenomenon is the greater usage of hospital facilities by males.\(^2\text{-}^3\) However, it is a common observation in Accra that patients under 15 years of age are most frequently brought to hospital by a parent, who invariably is the mother, or a female relative. In this series 86 of the 190 patients were under 15 years of age. 57 out of 86, i.e. 66.3% were males, about the same ratio of 3:2 found by Osuntokun et al.\(^5\) in their series.

The peak incidence in the first five years of life in this series is in consonance with the findings of Dada.\(^2\) The second peak is between 5-10 years. Indeed the first 10 years of life accounted for 33.1% of all the cases seen in this series. Birth injuries, febrile convulsions or malnutrition have been offered as possible aetiologic factors by Mundy-Castle et al.\(^7\).

The rarity of petit mal epilepsy in Africans is again found.\(^1,5,8\) There were 4 cases in this series, aged: 6 years, 13 years, and two 16 year-olds. The apparent rarity of petit mal among Africans was also noticed by Hurst et al.\(^9\) in the Bantu and by Cosnet,\(^10\) when he wrote on neurological disorders in the Zulu. The reason for the low incidence of petit mal among Africans is not known.

Three cases of hypsarrhythmia were in infants under 2 years of age. They all had a history of prolonged or difficult birth.

Focal epilepsy is the commonest abnormality seen. 50% of all the cases were diagnosed as focal epilepsy with 37.4% being specifically temporal lobe epilepsy. Osuntokun et al.\(^5\) found a similar incidence of 36% in children in Ibadan, Nigeria, diagnosed with EEG. Dada\(^2\) reported that temporal lobe epilepsy accounted for 20% and grand mal 51.2% of his cases from Lagos, while Billinghurst\(^1\) found grand mal in 85% of his 79 cases from urban Uganda. Only 3 of these suffered from temporal lobe epilepsy. The classification of Dada and Billinghurst was on the whole a clinical one, not based on EEG studies.

Febrile convulsions are common in Ghana and the tropics in general. Unstedt\(^11\) and others believe that these convulsions in infancy may lead to sclerosis of Ammon’s horn with the establishment of an epileptic focus in the temporal lobe.

The classification of epilepsy is important in clinical practice as the management of the patient including the correct use of drugs will depend on it. The cocktail approach sometimes adopted in an attempt “to cover all possibilities” is not advisable.

Acknowledgements

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References