

Clinical, EEG and Psychometric Aspects of Epilepsy in a Sample of Egyptian School Children

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ABSTRACT

The authors examined 40 epileptic Egyptian schoolchildren and closely matched 10 normal subjects in the course of 1988-89. The clinical types of epilepsy were of the generalized types in 77.5%; grand mal fits in 37.5%, petit mal fits in 30%. The focal type of partial simple or complex seizures were present in 22.5%. EEG records showed specific epileptiform discharges in 67.5% and were normal in 17.5%. The mean I. Q. was 92.9 ± 8.1 compared to 102 ± 6.2 for the control group. This was correlated to the type of seizure, severity of EEG changes and type of medication. The personality dimensions were different in the epileptic compared to the control group with high extraversion scores in 55%; high neuroticism in 40%; psychoticism in 5%. These were partially related to the type of seizure with high psychoticism score in patients with partial seizures.

INTRODUCTION

Childhood epilepsy is defined by National Child Development Study (NCDS) as "a recurrent paroxysmal disturbance of consciousness, sensation or movement, primarily cerebral in origin, unassociated with acute febrile episodes".

According to this definition, Ross *et al* (1980) reported that 5:1000 children of school age had recurrent acute febrile seizures.

However, epilepsies in childhood are of much more variable expression and outcome than those affecting adults.

Aicardi *et al* (1985) reported that the clinical picture of childhood epilepsy is characteristic in each age group which requires the use of a different classificatory system.

The impact of epilepsy with its different presentations on the intellectual functions was reported by Collins as far back as 1941 and by Donovan (1952).

More recently, Farwell *et al* (1985) reported that the IQ of cases with epilepsy was significantly lower than that of normal controls and they related this finding to the seizure type as well as to age of onset, frequency, the progression of the underlying disorder, and the build-up of anticonvulsants. Bett (1976), however, noted the possible relation of this deterioration to either unrecognized psychotic illness or personality disorder.

Thus, Rangaswami (1983) observed that school children with epilepsy were significantly more maladjusted in comparison to non-epileptics in the areas of education and emotions, as well as in relation to global adjustment.

The aim of this work is to study epilepsy among sample of school children clinically, electroencephalographically as well as psychometrically to evaluate their cognitive functions, selected personality traits, with a view to detecting

in associations between the aforementioned and the type of epilepsy, anti-convulsant medication and EEG changes.

SUBJECTS AND METHOD

This work was carried out on a sample of 40 epileptic school children outpatients attending El Zahraa Neurology OP clinic.

They had a mean age of 11.3 ± 2.2 and consisted of 17 males and 23 females. The diagnosis was made after careful history taking, from the patient and a witness and corroborated by EEG. Cases with focal neurological signs were excluded from the study. A control group made up of 10 healthy normal children matched for age, sex, education and socio-economic status was included.

Each subject of the experimental group was submitted to:

1-Detailed history and examination with the results recorded in a specially designed sheet. Patients were classified in 3 groups depending on their medication & its type.

Group a = 20 patients with no medication. Group b1 = 12 patients receiving phenobarbitone and/or hydantoin.

Group b2 = 8 patients receiving carbamazepine.

2-EEG was carried out by using an 8 channel Nihon koden-7209 apparatus, using the 10-20 International Electrode placement. Both unipolar and bipolar montages were used.

Activation by hyperventilation and photic stimulation were routinely applied. The calibration was set at 50 microvolts, time constant at 0.1 sec, paper speed at 30/sec.

3- The abbreviated form of the Stanford Binet test (standardized Arabic version Melika and Abdel Salam (1985) was used to estimate the IQ.

4- The standardized Arabic version of the Junior Eysenck Personality Questionnaire was applied to measure the dimensions of the personality.

5- The EEG tracings were interpreted

by describing 3 aspects of each record:

a-The character of the background activity. , b-The presence of epileptiform discharges (spikes or spikes and waves, sharp waves, episodic rhythmic slowing or fast rhythms). c- Due allowance was made for each subject's age when commenting on the background activity and dominant rhythms.

EEG changes were classified by an operational method used by the workers in this study into:

1- Non Specific Changes: in the form of minimal slowing of the background activity dissonant with the subject's age, and with no inter-hemispheric asymmetries.

2-Specific Changes:

a-Mild: including cases with $3 > =$ abnormal discharges per 20 minutes of the record without activation.

b-Moderate: 4-6 abnormal discharges per 20 minutes with or without side asymmetry.

c-More abnormal discharges than b.

RESULTS

1- The ages of the patients ranged from 6-16 years with a mean of 11.3 ± 2.2 and a peak in the age group 10-12 years.

Sex distribution was 17 males to 23 females.

2-Classification of the types of epilepsy according to Marsden and Reynolds classification (1982) showed that generalized fits were present in 77.5% of the cases, the grand mal tonic clonic type in (37.5%) followed by petit mal type (absence seizures) in 30%, then the myoclonic & atonic type, each in 5% Focal fits either simple or partial complex in 22.5% Table (1).

3- EEG records were normal in 17.5%, specific changes in 67.5% & non specific in 15%.

4- Psychometric results for determination of I. Q. by the abbreviated form of Stanford Binet test showed that the mean

I. Q. of the epileptic group was 92.9 ± 8.1 compared to 102 ± 6.2 for the control group the distribution of I. Q. among the epileptic group showed a peak in the range of 80-90 Fig. (1).

5- Correlation of the I. Q. results with the type of epilepsy showed that the lowest I. Q. was in association with the grand mal type (82.5) followed by the focal type (95.8).

While the highest I. Q. was in association with the atonic type (100.4) & patients with petit mal type had a mean I. Q. (98.0) Table (2).

6- Correlation of the I. Q. results with the EEG findings showed that the highest I. Q. was found in the group with normal EEG and the decrease in the I. Q. severity of was parallel to the degree of EEG Changes Table (3).

7- Correlation of the I. Q. with the 3 group of patients showed that patients with no medication had higher mean I. Q. (mean 95) followed by patients un-

der carbamazepine therapy, (mean I. Q. 90) while patients with hydantoins and/or phenobarbitone had a significantly lower I. Q. (mean 83).

8- Personality dimensions as tested by Junior Eysenck Personality Questionnaire showed, that extravert traits were present in 55%, neurotic traits in 40% and psychoticism in only 5% Table (4).

While in the control group extravert traits were present in 70%, neurotic traits in 30% and non of them had psychotic trait.

9- Correlation of the type of personality with the different types of epilepsy showed that grand mal fits were associated with high percentage of extraverted traits, petit mal fits with high neuroticism, the focal fits were associated with equal neuroticism and extraverted traits in addition to proportionally high psychoticism trait (5%). Table (5).

TABLE I

Shows Types of Epilepsy Among the 40 Patients

Type of Fit	No. of cases	%
I-Generalized	31	77.5
Grand Mal	15	37.5
Petit Mal	12	30
Myoclonic	2	5
Atonic	2	5
II-Focal		
Partial simple or complex	9	22.5

TABLE II

Shows the Relation Between the Type of Epilepsy and I.Q.

Type of epilepsy	Mean Value of I.Q.	X2 Test
I-Generalized	82.5 ($\pm$ 3.5)	Significant
Grand Mal	98.0 ($\pm$ 4.3)	P < 0.05
Petit Mal	100.4 ($\pm$ 6.1)	
Myoclonic	97.6 ($\pm$ 5.1)	
II-Focal		
Psychomotor	85.8 ($\pm$ 2.3)	

TABLE III

EEG Findings & Relation to I.Q.

EEG findings	No.	%	Mean I.Q.	X 2 -Test.
Normal	7	17.5	100	
Abnormal.	33			
-Mild	5	12.5	95	S.
-Moderate	18	45	86	P < 0.05
-Severe	4	10	78	
-Non-specific	6	15	84	

TABLE IV

Personality dimensions of Epileptic Patients

No. of cases	Personality dimensions		
	Extravert	Neurotic	Psychotic
No. of cases	22	16	2
%	55	40	5
X ² Test	H.S. (P< 0.01)		

TABLE V

The Relation Between the Type of Epilepsy and Personality.

Type of Epilepsy	%	%	%	Total
	E	N	P	
I-Generalized				
Grand mal	66	27	7	100
Petit mal	25	75	-	100
Atonic	50	50	-	100
Myoclonic	100	--	-	100
II-Focal				
Psychomotor	44	44	12	100
x ² -Test	Highly significant (P<.0.01)			

DISCUSSION

In this study the types of epilepsy among school children were of the generalized types in 77.5%. Grand mal fits in 37.5%, absence seizures in 30%, myoclonic & atonic fits each in 5% while partial seizures were recorded in 22.5%. This agreed with that reported by Aicardi (1983) who classified epilepsy among children according to 3 age groups and noted that the main seizure types at the age of 4-10 years were of the typical grand mal seizures & absence seizures followed by the partial seizures with its several types and well defined features, while in the age over 9-10 years three main syndromes were common; these are nocturnal grand mal, benign juvenile myoclonic epilepsy of Janz's syndrome as described by Delgado-Escueta *et al* (1984) and the typical absences which are less frequently repeated than in younger patients. Loiseau *et al* (1983) have also underlined the relative frequency of isolated partial seizures in adolescents.

EEG records in this study showed normal tracings in 17.5% and specific changes were present in 67.5%.

Ajmone-Marsan *et al* (1970) found that 55% of initial EEG tracings showed no epileptiform activity, however repeated tracings performed reduced the figure to 8%.

In a recent study Salmisky *et al* (1987) noted the importance of repeating the EEG as in 50% of patients epileptiform activity were present on the 1st EEG, in 84% by the third and in 92% by the fourth.

In the present study cognitive functions were studied by global measure i.e. the I.Q. and this was lower than the control group (92.9 ± 8.1) this agreed with Farwell *et al* (1985) who found an average I.Q. of 93 in a group of 118 people with epilepsy while Bourgeois *et al* (1983) found an average I.Q. of 100, possible explanations for this discrepan-

cy are suggested by Ellenberg *et al* (1986) to be due to differences in social classes and race.

The relation of I.Q. to the type of seizure in our study is apparent as the cases with grand mal fits had the lower I.Q. (mean 82.5) while in petit mal seizures this was 98 and in the partial seizures 85.8. These results are in agreement with Fedio *et al* (1969), Klove *et al* (1974) and Giordani *et al* (1985) while Farwell *et al* (1985) reported that all types of seizures were associated with below control intelligence except the classic absence seizures. The results of correlation of the I.Q. with the type of medication in this study are not far from that reported by Trimble & Corbett (1980), Thompson & Trimble (1982).

On the same time the decrease in I.Q. in our study was correlated to the severity of EEG changes which does not agree with Corbett *et al* (1985) who found no correlation between mental deterioration and overall severity of EEG abnormalities, this inconsistency may be related to the extent to which neurological impairment is present in the sample.

personality tests as measured by the junior Eysenck Personality Inventory in this study showed high extraversion score in 55%, high neuroticism in 40% and psychoticism in 5% of case which is different from the control group so it seems that epileptic children do display a common characteristics in their personality which agree with the observations of Bradley (1951) as well as some of the findings of Osman *et al* (1987).

This combination of high neuroticism and extraversion according to Eysenck is associated with hysteria and psychopathy, while high psychoticism is associated with classness, eccentricity and cruelty (Okasha, 1987).

The proportionally high psychoticism scores in this study was only associated with cases of partial seizures which indicates the existence of high degree of susceptibility to psychopathology. This finding is compatible with what has

been reported on abnormalities of the temporal lobe and schizophrenia like psychosis by Slater *et al* (1963), anti-social behaviour and personality (Shulka *et al* 1979) and the obsessive compulsive disorder (Okasha and Raafat 1989).

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ABSTRAIT

Étude Clinique, Éléctroencephalographique , Et Psychometrique D'un Echantillon D'enfants Épileptiques Egyptiens

40 enfants épileptiques âgés de 6 a 16 ans, ainsi que 10 enfants normaux ont été examinés pendant 1988.

Les formes cliniques de l'épilepsie rencontrées, étaient: épilepsie generalisée 37. 5%, dont 22. 5% crises de Grand mal et 30% crises de petit Mal, et 22. 5% d'épilepsies partielles: elementaires et élaborées.

67.5% des tracés électroencephalographiques présentaient des figures paroxystiques pathologiques. Le Quotient Intellectuel moyen des épileptiques était 92, 5, tandis que celui des cas temoins était 102. Une association importante existait entre le Q. I et l'intensité des manifestations pathologiques notées dans les tracés.

Les resultats de l'exploration psychologique, effectuée avec le "Junior Eysenck personality Inventory" démontraient des notes élevées sur les trois échelles du test, par rapport avec les notes des cas temoins, selon l'ordre suivant: introversion, nevrotisme, et psychotisme.

Les notes sur cette dernière échelle étaient particulièrement élevées chez les sujets souffrants d'épilepsie partielle. Il avait aussi un abaissement du Q. I chez les sujets sous traitement, particulièrement avec les hydantoines et les barbituriques.

الموجز

الأكلينيكية وتخطيط المخ الكهربائي والقياسات النفسية للحالة دراسة

فى مرض الصرع فى عينة من أطفال المدارس المصريين

قام الباحثون بفحص ٤٠ حالة صرع لدى أطفال مصريين فى سن المدارس . كما قاموا بفحص عشرة أطفال أسوياء كعينة ضابطة ، وذلك خلال عام ١٩٨٨-١٩٨٩ . ولقد أظهرت النتائج أن أنواع الصرع فى مجموعة المرضى من نوع الصرع الكلى فى ٧٧,٥ ٪ (نوبات صرع كبرى فى ٣٧,٥ ٪ ، و نوبات صرع صغرى فى ٣٠ ٪) ، ووجد الصرع البؤرى من النوع الجزئى (البسيط أو المعقد) فى ٢٢,٥ ٪ . وقد أظهر تخطيط المخ الكهربائي تغيرات على شكل إنطلاقات صرعية واضحة فى ٦٧,٥ وكان طبيعيا فى ١٧,٥ ٪ من الحالات . وقد كان متوسط نسبة الذكاء لدى المرضى ٩٢,٥ بالمقارنة الى ١٠٢ فى العينة الضابطة ، وكان النقص فى متوسط نسبة الذكاء مرتبطا بدرجة التغيرات فى تخطيط المخ ونوعية العلاج . وكانت نتائج قياسات الشخصية مختلفة فى عينه المرضى عنها فى العينة الضابطة حيث وجد أن ٥٥ ٪ منهم تميل شخصياتهم الى الانبساطية ، ٤٠ ٪ الى العصابية ، والذهانية فى ٥ ٪ ، ونسب هذه القياسات كانت مرتبطة بنوعية الصرع مع ازدياد نسبة الشخصية الذهانية فى حالات الصرع الجزئى .