THE DETERMINANTS OF SEIZURE SEVERITY IN NIGERIAN EPILEPTICS

I. Imam**, O.A. Talabi*, E.O. Sanya*, A. Ogunniyi*.
Department of Medicine, University College Hospital, Ibadan, Nigeria and
**Department of Neurology Meldon Ward Derriford Hospital Plymouth PL6 8DH, United Kingdom.*

ABSTRACT

Background: Epilepsy is a chronic disease and the control of seizures is central to its management. While seizure frequency has been the traditional index of epilepsy control, severity of seizures is probably as important as seizure frequency in this regard. Seizure severity scales have therefore been developed to assess the impact of antiepileptic drugs on seizure control. The eight items of the national hospital seizure severity scale were applied in this study to Nigerian subjects with epilepsy to determine which aspects of seizure severity were considered relevant from the patients' perspective.

Materials and methods: Twenty-eight confirmed subjects with epilepsy at the University College Hospital, Ibadan, were studied. The National Hospital seizure severity scale questionnaire was administered to all subjects. This assesses generalisation of seizures, falls, injuries, urinary incontinence, warning interval before loss of consciousness, automatisms and time of recovery on a graded scale.

Results: The most frequent indices of seizure severity in Nigerian epileptics is the generalisation of seizures in 85.7% of subjects, incontinence of urine in 78.6%, absence of protective warning time in 75% and occurrence of serious injuries in71.5%. Occurrence of falls and disruptive automatisms were less frequent. Seizure severity scores were worse in subjects with longer duration of epilepsy and in those on monotherapy.

Conclusions: The indices of seizure severity that occurred most frequently in Nigerian subjects with epilepsy were generalisation of seizures, incontinence of urine, absence of protective warning time and serious injuries. These may need to be addressed in the management of epilepsy patients. Subjects on monotherapy in this study had worse seizure severity scores and this may indicate the need to consider early rational polytherapy in order to improve seizure control.

INTRODUCTION

Epilepsy control is traditionally measured by determining the frequency of seizures. The severity of seizures is however a significant determinant of the quality of life and self-esteem of subjects with epilepsy and this is independent of the frequency of seizures[1-3]. This is because anti-epileptic drug therapy may improve seizure severity without necessarily reducing seizure frequency[3,4].

The major determinants of the severity of seizures are seizure type and duration, post-ictal events, automatisms, warnings, tongue biting, incontinence, injuries, and functional impairment[5]. These are the main components of the seizure severity scales that have been developed like the VA, Chalfont-National Hospital, Liverpool, Hague, and the Occupational Hazard Scales[5]. These scales have been found to be reliable and useful in monitoring seizure control because they correlate with patients' quality of life and use severity indices

Correspondence: Dr. Ibrahim Imam
E-mail: ibrahimimam2000@yahoo.com

that are important in the target populations in which they were developed[4,6,7].

The National Hospital Seizure Severity Scale (NHS3) is a simplified version of the chalfont seizure severity scale which has the advantage of speed and ease of administration[8]. It has eight seizure-related factors and generates a score from 1 to 27 with the higher the scores reflecting worse seizure severity. This study was carried out to verify which indices of seizure severity were relevant to Nigerian subjects with epilepsy.

MATERIALS AND METHODS

Twenty-eight confirmed subjects with epilepsy attending the neurology clinic of the University College Hospital, Ibadan, were consecutively studied between January and June 2000. Information was obtained from subjects and eyewitness accounts of close friends or relatives. The National Hospital seizure severity scale questionnaire was administered to the subjects by the authors and information was obtained with regard to generalisation of seizures, falls, injuries sustained, warning time before seizures, recovery time after seizures, urinary incontinence and

automatisms. Falls, urinary incontinence and warning time were considered significant if they occurred often, always or almost always (Appendix 1). Injuries were considered significant if they involved burns, scalds, deep cuts, fractures, tongue biting or severe headache. Recovery time was considered delayed if it lasted more than ten minutes. Automatisms were labelled disruptive if they involved shouting, wandering or undressing. Poor seizure types were defined as primary generalised and complex partial seizures. All subjects had electroencephalography done and seizures were classified according to the International League Against Epilepsy criteria[9]. Statistical analysis was done by Epi Info 6 computer package. The Student's t test was used to assess differences between continuous variables. A p value of 0.05 or less was considered significant.

RESULTS

Twenty-eight subjects were studied. Nineteen subjects (68%) were males and nine (32%) were females. The mean age was 27.2 years in the males and 24.0 in the females. Nineteen subjects (67.9%) were classified as generalised tonic clonic, 7 (25%) as complex partial, one (3.6%) as simple and one subject (3.6%) had only aura.

The most frequent index of seizure severity was the high prevalence of poor seizure types. Nineteen subjects (68.5%) had primary generalised seizures, 7 (25%) had complex partial seizures and one (3.6%) had simple partial seizures. One subject had only aura. Seizures eventually became generalised in 24 subjects (85.7%) and this was the second most common index of seizure severity documented. Twenty-two subjects (78.6%) have frequent urinary incontinence while 21 (75%) do not have enough warning time to protect themselves before seizures. Twenty subjects (71.5%) have sustained serious injuries during seizures. Occurrence of falls was however not as common as only 9 subjects (32.1%) reported this. Only 4 subjects (14.8%) reported disruptive automatisms while only 2 subjects (7.5%) had delayed recovery time after seizures. These findings are summarised in **Figure 1**.

The mean severity score was 16.05 (4.9) in the males and 17.55 (5.8) in the females. This was not statistically significant (p=0.5). Mean seizure severity scores were 17.3 in subjects on only one antiepileptic drug while it was 13.3 in subjects on more than one drug. This was statistically significant (p value 0.03). Subjects with epilepsy duration of more than 10 years duration had a mean score of 19.1. This was significantly worse than the score of 14.0 in subjects with epilepsy of less than 10 years duration. These findings are shown in **Table 1**.

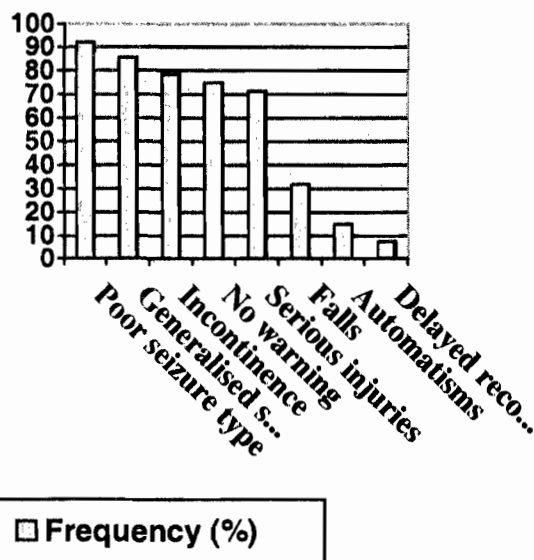*Figure 1:* **Frequency of indices of seizure severity in the study subjects.**

□ **Frequency (%)**

Table 1: **Relationship of epilepsy characteristics with seizure severity scores**

Epilepsy characteristics	Mean Seizure Severity		P value
Sex:	Male	16.0 (4.9)	0.5
	Female	17.5 (5.8)	
Epilesy duration	< 10 Years	14 (4.49)	0.008*
	≥10 Years	19.1 (4.0)	
Number of drugs:	One	17 (4.3)	0.037*
	> one	13.3 (6.1)	

*Significant Standard deviations in parentheses

DISCUSSION

This study has shown that the most frequent indices of seizure severity in the subjects studied are generalisation of seizures, the frequent occurrence of urinary incontinence, absence of sufficient warning time before seizures, and occurrence of serious injuries. Because the determinants of seizure severity are diverse, it may be practical to focus on these items in the clinical setting when addressing epilepsy control in Nigerian subjects. Disruptive automatisms and delayed recovery time after seizures were less frequent but larger studies are needed to consider the relevance of these items in Nigerians.

The commonest occurrence of primarily generalised seizures in this study accounts for one of the major indices of seizure severity. Partial epilepsies are control in the subjects studied. This is supported

by the fact that worse seizure severity was recorded in epileptic subjects on monotherapy than on polytherapy in this study. Although some studies have however reported better seizure control on monotherapy compared to polytherapy[12-14], larger studies have shown that polytherapy was associated with better seizure control[15,16]. It may be worthwhile considering add-on therapy for patients who are poorly controlled on monotherapy as rational polytherapy is recommended for such patients[17].

Seizure severity scores were also worse in subjects with longer duration of epilepsy in this study. The reason for this is not entirely clear and it may be related to the implications of a chronic illness on drug compliance.

CONCLUSION:

The common seizure severity indices in Nigerian subjects with epilepsy are generalisation of seizures, the frequent occurrence of urinary incontinence, absence of sufficient warning time before seizures, and occurrence of serious injuries. These should be addressed as much as seizure frequency in the management of Nigerian patients with epilepsy. Because subjects on monotherapy in this study had worse seizure severity scores, early consideration for conversion to polytherapy may improve seizure control.

REFERENCES

1. **Hoch DB, Hill RA, Oas KH.** Epilepsy and mental decline. In: Devinsky, O (ed). Neurol Clins: Epilepsy II: special issues. 1994: 101-113.

2. **Perrine K, Congett S.** Neurobehavioral problems in epilepsy. In: Devinsky O (ed) Neurol Clins: Epilepsy II: Special Issues. 1994:129-152.

3. **Smith DF, Baker GA, Dewey M, Jacoby A, Chadwick DW.** Seizure frequency, patient-perceived seizure severity and the psychosocial consequences of intractable epilepsy. Epilepsy Res 1991; 9: 231-241.

4. **Baker GA, Smith DF, Dewey M, Morrow J, Crawford PM, Chadwick DW.** The development of a seizure severity scale as an outcome measure in epilepsy. Epilepsy Res 1991; 8: 245-251.

5. **Cramer JA, French J.** Quantitative assessment of seizure severity for clinical trials: a review of approaches to seizure components. Epilepsia 2001; 42: 119-129.

6. **Vickrey BG, Berg AT, Sperling MR, et al.** Relationships between seizure severity and health-related quality of life in refractory localization-related epilepsy. Epilepsia 2000; 41:760-764.

7. **Rapp S, Shumaker S, Smith T, Gibson P, Berzon R, Hoffman R.** Adaptation and evaluation of the Liverpool Seizure Severity Scale and Liverpool Quality of Life battery for American epilepsy patients. Qual Life Res 1998; 7: 467-477.

8. **O'Donoghue MF, Duncan JS, Sander JW.** The National Hospital Seizure Severity Scale: a further development of the Chalfont Seizure Severity Scale. Epilepsia 1996; 37: 563-571.

9. **Mattson RH.** Medical management of epilepsy in adults. Neurology 1998; 51 (Supl 4): S15-S20.

10. **Keranen T, Silanpaa M, Riekkinen PJ.** Distribution of seizure types in an epileptic population. Epilepsia 1988; 29: 1-7.

11. **Danesi MA.** Classification of the epilepsies: an investigation of 945 patients in a developing country. Epilepsia 1985; 26: 131-136.

12. **Shorvon SD, Reynolds EH.** Reduction in polytherapy for epilepsy. BMJ 1979; 2: 1023-25.

13. **Thompson PJ, Trimble MR.** Anticonvulsant drugs and cognitive functions. Epilepsia 1982; 23: 531-544.

14. **Ogunniyi A, Osuntokun BO.** Effectiveness of anticonvulsant therapy in Nigerian Africans. East Afr Med J. 1991; 68: 707-713.

15. **Brodie MJ, McPhail E, MacPhee GJA, Larkin JG, Gray JMB.** Psychomotor impairment and anticonvulsant therapy in adult epileptic patients. Eur J Clin Pharm 1987; 31: 655-660.

16. **Loiseau P, Strube E, Broustet D, et al.** Learning impairment in epileptic patients. Epilepsia 1983; 24: 183-192.

17. **Leppik IE.** Monotherapy and polypharmacy. Neurology 2000; 55(11 Suppl 3): S25-29

Determinants of seizure severity. Iman I. et. al.