

## SHOULD EPILEPSY EVER BE DIAGNOSED IN A PERSON WHO HAS HAD ONLY ONE SEIZURE? YES

Ettore Beghi

Laboratory of Neurological Disorders, Department of Neuroscience, IRCCS-Istituto Mario Negri, Milano, Italy

Epilepsy is a clinical condition of the brain characterized by recurrent seizures. For this reason, in 2006 the International League Against Epilepsy (ILAE) defined epilepsy as “a disorder of the brain characterized by an enduring predisposition to generate epileptic seizures and by the neurobiologic, cognitive, psychological, and social consequences of this condition. The definition of epilepsy requires the occurrence of at least one epileptic seizure”.<sup>1</sup> Although there are no definite elements predicting a relapse after a first seizure, several circumstances support the possibility of diagnosing epilepsy even at the time of a first seizure. The presence of a family history of seizures and epilepsy, a structural brain lesion with epileptogenic potential, and the detection of epileptiform abnormalities in the interictal electroencephalogram (EKG) have all been associated with an increase in the risk of recurrence after a first unprovoked seizure, which approximates the risk of a third seizure in patients with two unprovoked seizures.<sup>2,3</sup> Some seizure types, if associated with age and specific EEG patterns, may predict epilepsy even at the first seizure. These include, among others, seizures occurring in patients with demographic and clinical features suggesting juvenile myoclonic epilepsy, childhood absence epilepsy, West syndrome, and Rolandic epilepsy.<sup>4</sup> In clinical practice, there is a consensus on beginning treatment after the first seizure when the EEG shows abnormalities such as generalized spike-wave discharges, when MRI demonstrates an epileptogenic brain lesion, and in elderly patients.<sup>5</sup> This latter population may have, in fact, multiple risk factors potentially affecting the risk of subsequent seizures.

A subdivision between definite, probable, and possible epilepsy has been suggested to stratify levels of diagnostic certainty.<sup>6</sup> Definite epilepsy should be defined by two or more unprovoked seizures at least 24 hours apart. Probable epilepsy would be consistent with a single unprovoked seizure associated with surrogate markers, such as epileptiform EEG abnormalities, MRI lesions, particular genes, or index clinical findings. Possible epilepsy would denote a condition with a single unprovoked seizure lacking surrogate markers to indicate a seizure relapse.

Taking into account the above reasons, a new operational clinical definition of epilepsy has been recently issued by the ILAE.<sup>7</sup> According to this definition, epilepsy is defined by any of the following conditions: 1. At least two unprovoked (or reflex) seizures occurring more than 24 hours apart; 2. One unprovoked (or reflex) seizure and a probability for further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years; 3. Diagnosis of an epilepsy syndrome. This revised definition implies that epilepsy can be also diagnosed after one unprovoked seizure provided that factors are present suggesting a lowered seizure threshold.

### References

1. Fisher RS, van Emde Boas W, Blume W, et al. *Epileptic seizures and epilepsy: Definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE)*. *Epilepsia* 2005; 46: 470-472.
2. Berg AT, Shinnar S. *The risk of seizure recurrence following a first unprovoked seizure: A quantitative review*. *Neurology* 1991; 41: 965-972.
3. Hesdorffer DC, Benn EK, Cascino GD, Hauser WA. *Is the first acute symptomatic seizure epilepsy? Mortality and risk for recurrent seizure*. *Epilepsia* 2009; 50: 1102-1108.
4. Panayiotopoulos CP. *A Clinical Guide to Epileptic Syndromes and their Treatment*. 2<sup>nd</sup> Ed., Springer-Verlag, London Ltd, 2007.
5. Villanueva V, Sanchez-Alvarez JC, Pena P, et al. *Treatment initiation in epilepsy: An expert consensus in Spain*. *Epilepsy Behav* 2010; 19: 332-342.
6. Fisher RS, Leppik I. *Debate: When does a seizure imply epilepsy?* *Epilepsia* 2008; 49 (suppl.9): 7-12.
7. Fisher RS, Acevedo C, Arzimanoglou A, et al. *A practical clinical definition of epilepsy*. *Epilepsia* 2014 (in press).