Seizures and Epilepsy in Adolescents and Adults

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All individuals with epilepsy experience seizures, whereas all those with a seizure do not have epilepsy. An epileptic seizure is a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain.[1] Epilepsy is a disorder of the brain characterized by an enduring predisposition to generate epileptic seizures and by the neurobiologic, cognitive, and psychosocial consequences of this condition.[1] The definition of epilepsy requires the occurrence of at least 1 epileptic seizure.[1] In practice, however, epilepsy is most commonly diagnosed after 2 or more unprovoked seizures.

Seizures can be acute, symptomatic, or unprovoked. Acute symptomatic seizures occur at the time of a systemic insult, such as during alcohol withdrawal or in the setting of severe hypoglycemia, or in close temporal association with a brain insult, such as in acute head trauma. The condition leading to the seizure is believed to disrupt normal brain neuronal physiology in a transient manner. Unprovoked seizures occur in the absence of such precipitating factors. Recurrent provoked seizures do not constitute epilepsy and therefore do not require treatment with antiepileptic medication.

Epilepsy has many causes, including structural (eg, tumors, strokes, and vascular abnormalities), metabolic, infectious, and genetic. Often, no clear cause can be determined. Several epilepsy syndromes have been recognized with clustering of symptoms and signs in epilepsies, which aid in accurate diagnosis and management of seizure disorders.

Epidemiology

Epilepsy is a common disease affecting about 50 million people worldwide. The lifetime risk of developing epilepsy is estimated at about 3% to age 80.[2] The average annual incidence of epilepsy is about 55 per 100,000 population in the United States and in Europe.[2] The highest incidence

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rates are in infants under 1 year of age and in those >60 years of age. Men tend to be affected slightly more than women. Studies in several countries have shown similar prevalence and incidence rates as in the United States. The lifetime risk of a single seizure from any cause is estimated at about 10%.

Classification

A standardized classification system for seizures and epilepsy was developed to create a common language and facilitate communication among clinicians and researchers as well as to aid in diagnosis and management. The International League Against Epilepsy classifications were first published in 1960 and last updated officially in 1981 for seizures and 1989 for epilepsies and were mostly based on concepts formulated before modern neuroimaging and genomic research.[3] The International League Against Epilepsy Commission on Classification and Terminology has recently revised concepts, terminology, and approaches for classifying seizures and forms of epilepsy.[3] The 2 major categories of seizures, generalized and partial, are redefined as generalized and focal. Generalized seizures originate within, and rapidly engage, bilaterally distributed networks. Focal seizures originate within networks limited to one hemisphere of the brain. The classification of generalized seizures has been simplified, specifically with the elimination of neonatal seizures as a subcategory and with a simplified subclassification of absence seizures (Table 1). The distinction between the different types of focal seizures based on level of consciousness (eg, simple partial, complex partial, and partial seizures secondarily generalized) is eliminated in the revised classification scheme. Focal seizures are now described based on their manifestations, such as dyscognitive or focal motor (Table 2).

In the former classification scheme, epilepsies were subdivided into 3 categories based on etiology: idiopathic, symptomatic, or cryptogenic syndromes, indicating a presumed genetic cause, underlying brain lesion, or suspected, but unidentified brain lesion, respectively. In the revised classification scheme, these are now referred to as genetic, structural-metabolic, and unknown (Table 3). Genetic epilepsy is the direct result of a known or presumed genetic defect. In structural-metabolic epilepsy, there is a distinct structural or metabolic condition that is associated with a significantly increased risk of developing epilepsy. Unknown epilepsy suggests that the underlying cause is not yet identified.

Another change in the revised classification is the recognition of the concept of "electroclinical syndrome" to mean a complex of clinical