



REVIEW ARTICLE

SOME HETEROCYCLICS WITH ANTICONVULSANT PROPERTIES

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The anticonvulsants are Food and Drug Administration approved, for the prevention and/or treatment of various seizure disorders either as monotherapy or adjunctive therapy. The goal of an anticonvulsant is to suppress the rapid and excessive firing of neurons that start a seizure. Due to the non-selectivity of the anticonvulsants and the undesirable side effects posed by them the use of current antiepileptic drugs has been questioned. This led to an intensive investigation in this area worldwide during the past 10 years. As far as drug efficacy and safety is concerned there have been some significant outcomes and the findings are promising. This review covers the brief description of epilepsy and various heterocyclic moieties that have shown encouraging anticonvulsant activity and less neurotoxicity.

Key words: Heterocyclics, Anticonvulsant activity, Neurotoxicity, Epilepsy.

INTRODUCTION

More than a century ago, John Hughlings Jackson, the father of modern concepts of epilepsy, proposed that seizures were caused by "occasional, sudden, severe, excessive, rapid and local discharges of gray matter", and that a generalized convulsion resulted when normal brain tissue invaded by the seizure activity initiated in the abnormal focus. This insightful proposal provided a valuable framework for thinking about mechanism of epilepsy. The advent of the electroencephalogram in the 1930s permitted the recording of electrical activity from the scalp of humans with epilepsy and demonstrated that the epilepsies are disorders of neuronal excitability (Brunton *et al* 2006).

According to International League against Epilepsy and International Beaurue of Epilepsy, an epileptic seizure is a transient occurrence of signs and or symptoms due to abnormal excessive or asynchronous neuronal activity in the brain. Epilepsy is the disorder of the brain

characterized by an enduring predisposition to generate epileptic seizures, and by the neurobiologic, cognitive, psychological, and social consequences of the condition (Fisher *et al* 2005). Epileptic episodes are called seizures and have different manifestation ranging from brief lapses of lack of attention to limited motor, sensory, or psychological changes. In severe cases they include prolonged loss of consciousness with convulsive motor activity (Gavernet *et al* 2007).

The definition of epilepsy requires the occurrence of at least one epileptic seizure. Epileptic seizures are classified into various categories: A) Partial-onset seizures: Partial-onset seizures are further classified as simple partial seizures, complex partial seizures. All partial seizures are characterized by onset in a limited area, or focus, of one cerebral hemisphere. B) Generalized-onset seizures are classified into 6 major categories: (i) absence seizures, (ii) tonic seizures, (iii) clonic seizures,