What is epilepsy?

Epilepsy is a neurological disorder that affects people in every country throughout the world. Epilepsy is also one of the oldest conditions known to mankind. It is characterized by a tendency to recurrent seizures and it defined by two or more unprovoked seizures.

The belief widely held in many countries is that a person with epilepsy is seized by a supernatural force or power. This ancient belief is reflected in the name of the disorder – the word "epilepsy" being derived from the Greek word "epilambanein" which means "to seize or attack". We now know, however, that seizures are the result of sudden, usually brief, excessive electrical discharges in a group of brain cells (neurones) and that different parts of the brain can be the site of such discharges. The clinical manifestations of seizures will therefore vary and depend on where in the brain the disturbance first starts and how far it spreads. Transient symptoms can occur, such as loss of awareness or consciousness and disturbances of movement, sensation (including vision, hearing and taste), mood or mental function.

SEIZURES

Seizures may vary from the briefest lapses of attention or muscle jerks to severe and prolonged convulsions. They may also vary in frequency, from less than one a year to several per day. Seizures are classified according to where in the brain they arise, for instance:

* **Partial or focal seizures**

These seizures arise from an electric discharge of one or more localised areas of the brain regardless of whether the seizure is secondarily generalized. Depending on their type, they may or may not impair consciousness. Whether seizures are partial or focal, they begin in a localized area of the brain, but then may spread to the whole brain causing a generalized seizure.

* **Generalized seizures**

The electrical discharge which leads to these seizures involves the whole brain and may cause loss of consciousness and/or muscle contractions or stiffness. They include what used to be known as "grand mal" convulsion and also the brief "petit mal" absence of consciousness.
Status epilepticus

This is a state in which a person has frequent seizures without recovery of consciousness between each episode. It is a dangerous state and if not treated may lead to brain damage or death.

It is unclear why particular seizures occur at a particular age or time and not at other ages or times. Provocative factors, however, are recognized in some patients. For example, certain flashing lights (discos, television, video games etc.), over-breathing, over-hydration, loss of sleep, and/or emotional and physical stress, may stimulate seizures. Although these are not causes of epilepsy, they may influence the timing and frequency of seizures.

Different epileptic syndromes are based on the age of onset, the type of seizure, the presence or absence of detectable brain disease and genetic background. However, medical science is only at an early stage in understanding these different types.

Epidemiology: Prevalence, Incidence and Mortality of Epilepsy

Epilepsy knows no geographical, racial or social boundaries. It occurs in men and women and can begin at any age, but is most frequently diagnosed in infancy, childhood, adolescence and old age. Anyone can be affected by seizures. In fact, up to 5% of the world’s population may have a single seizure at some time in their lives, but a diagnosis of epilepsy is reserved for those who have recurring seizures, at least two unprovoked ones.

Prevalence

The prevalence of a disorder is the proportion of a population with that disorder at a given point in time. From many studies around the world it has been estimated that the mean prevalence of active epilepsy (i.e. continuing seizures or the need for treatment) is approximately 8.2 per 1,000 of the general population. However, this may be an underestimate as some studies in developing countries (such as Colombia, Ecuador, India, Liberia, Nigeria, Panama, United Republic of Tanzania and Venezuela) suggest a prevalence of more than 10 per 1,000.

* Thus, it is likely that around 50 million people in the world have epilepsy at any one time. The lifetime prevalence of epilepsy (i.e. the number of people presently in the world who have epilepsy now or have had it in the past or will experience it in the future) is approximately 100 million people.

Incidence

The incidence of a disorder is the number of new cases at a given time. Studies in developed countries suggest an annual incidence of epilepsy of approximately 50 per 100,000 of the general population. However, studies in developing countries suggest that this figure is nearly double that at 100 per 100,000.

One of the main reasons for the higher incidence of epilepsy in developing countries is the higher risk of experiencing a condition which can lead to permanent brain damage. These conditions include neurocysticercosis, meningitis, malaria, pre and perinatal complications and malnutrition.
Mortality

Epilepsy is associated with an increased risk of mortality. Death may be related to:

* An underlying brain disease, such as a tumour or infection;
* Seizures in dangerous circumstances, leading to drowning, burns or head injury, for example;
* Status epilepticus;
* Sudden and unexplained causes, or a possible respiratory or cardio-respiratory arrest during a seizure;
* Suicide.

Whilst studies on this subject are sparse, epilepsy-related deaths in young adults in the UK, for example, are 3 times higher than standard age-related mortality rates.

ETIOLOGY OF EPILEPSY

Epilepsy is often, but not always, the result of an underlying brain disease. Any type of brain disease can cause epilepsy, but not all people with the same brain disease will have epilepsy. In view of the fact that only a proportion of people who have a brain disease experience seizures as a symptom of that disease, it is suspected that those who do have such symptomatic seizures are more vulnerable due to biochemical/neurotransmitter reasons.

* There are still many people for whom the cause of their epilepsy cannot, as yet, be identified. In such cases, the theory most commonly accepted is that this epilepsy is the result of an imbalance of certain chemicals in the brain (especially chemical messengers known as neurotransmitters) causing them to have a low convulsive threshold.

* Children and adolescents are more likely to have epilepsy of unknown or genetic origin. The older the patient, the more likely it is that the cause is an underlying brain disease, such as a brain tumour or cerebrovascular disease, or is the result of head injury.

* Trauma and brain infection can cause epilepsy at any age, and as mentioned previously may account for a higher incidence of epilepsy in developing countries. For example, a common cause in Latin America is neurocysticercosis cysts on the brain caused by tapeworm infection, while in Africa, malaria and meningitis are common causes, and in India neurocysticercosis and tuberculosis often lead to epilepsy.

* Febrile illness of any kind can trigger seizures in young children. About 3% of children who have febrile convulsions go on to develop epilepsy in later life.

TREATMENT AND PROGNOSIS

Recent studies in both developed and developing countries have shown that up to 70% of newly diagnosed children and adults with epilepsy can be successfully treated (i.e., their seizures can be completely controlled for several years) with anti-epileptic drugs. After 2-5 years of successful treatment, drugs can be withdrawn in about 70% of children and 60% of adults without relapses.

* However, up to 30% of people may not respond to drug therapy. A factor which leads to worse prognosis is the presence of an underlying brain disease.
Partial seizures, especially if associated with a brain disease, are more difficult to control than generalized seizures.

Secondary seizures—such as those related to an acute, short-lasting brain disease, may run a self-limiting course. However, a significant proportion of people will develop established epilepsy.

For economic and social reasons, 3 out of 4 people with epilepsy do not receive treatment at all. Most of these people live in developing countries.

**KEY POINTS**

- Epilepsy is one of the most common neurological disorders and has no age, racial, social, sexual, or geographical boundaries.
- Up to 5% of people in the world may have at least one seizure in their lives.
- At any one point in time, 50 million people have epilepsy, especially in childhood, adolescence, and old age.
- Epilepsy can have profound social, physical, and psychological consequences.
- In up to 70% of people, epilepsy responds to treatment, but in developing countries, three-fourths of people with epilepsy may not receive the treatment they need.