Epilepsy: An Overview of Types

Epilepsy is a neurological disorder **characterised by the propensity for recurrent, unprovoked seizures**, which are transient occurrences of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain. The disorder encompasses a spectrum of conditions with varying aetiologies, clinical presentations, and seizure types. In the absence of expert medical advice and appropriate oversight, individuals with a documented history of epilepsy must be precluded from receiving any form of Integral Eye Movement Therapy (IEMT). This contraindication arises from the necessity to mitigate potential risks and ensure the safety and well-being of the client, as such therapies may provoke seizures in susceptible individuals.

Classification Based on Seizure Type

The primary classification of epilepsy is determined by the **type of seizure**, which is categorised into two main groups:

- **Focal Seizures**: Originating within networks limited to one hemisphere. These are subdivided based on the level of consciousness:
  - **With Retained Awareness**: Formerly known as simple partial seizures.
  - **With Impaired Consciousness**: Previously referred to as complex partial seizures.
  - **Evolution to Bilateral Tonic-Clonic Seizures**: Presenting with a progression of muscle rigidity followed by rhythmic muscle contractions.
- **Generalised Seizures**: Engaging networks distributed across both hemispheres simultaneously. Types include:
  - **Absence Seizures**: Manifest as brief lapses in awareness.
  - **Myoclonic Seizures**: Characterised by sudden, brief muscle jerks.
  - **Tonic-Clonic Seizures**: Known for convulsive movements.
  - **Atonic Seizures**: Leading to sudden loss of muscle tone.

Focal Seizures

Focal seizures, formerly known as partial seizures, originate within networks confined to one hemisphere of the brain. The clinical manifestations of these seizures are remarkably diverse, reflecting the region of the cortex in which the seizure originates.

With Retained Awareness

These seizures, previously termed simple partial seizures, occur without a loss of consciousness. Individuals experiencing these seizures retain full awareness but may report autonomic phenomena such as heart palpitations, skin flushing, or epigastric rising sensations. Motor signs can include jerking or tonic posturing of a limb, while sensory symptoms might involve unusual sensations, such as numbness or the feeling of 'pins and needles'. Visual, auditory, olfactory, or gustatory hallucinations are also possible if the corresponding sensory cortex is involved.

With Impaired Consciousness

Seizures with impaired consciousness, once called complex partial seizures, typically involve alterations in consciousness. The individual may exhibit unresponsiveness or a diminished awareness of the environment. Automatisms, such as lip-smacking, fumbling movements, or even walking, are often observed but executed without the individual's conscious control or recollection. These seizures frequently originate from the temporal lobe but can emanate from any cortical region. Postictal confusion is common, and the return to baseline may take minutes to hours.

Evolution to Bilateral Tonic-Clonic Seizures

Some focal seizures can generalise, leading to bilateral tonic-clonic seizures. The initial focal onset may manifest as a warning or 'aura' before consciousness is lost and generalised convulsive movements begin. The tonic phase is characterised by a sudden loss of consciousness with muscle stiffening, while the clonic phase involves rhythmic jerking movements. Sudden cessation of respiration during the tonic phase may lead to cyanosis, and injuries can occur from falls or during convulsions.

Generalised Seizures

Generalised seizures involve both cerebral hemispheres from the onset and are not preceded by focal activity. They represent a diverse group of seizure types, each with unique clinical features.

Absence Seizures

Typically presenting in childhood and often misinterpreted as inattentiveness, absence seizures are brief, lasting only a few seconds. The hallmark of these seizures is a disruption of consciousness associated with a cessation of ongoing activities. A blank stare, subtle body movements, and automatism, such as blinking or slight twitching of the lips, are characteristic. The electroencephalogram (EEG) during these seizures shows a pattern of 3 Hz spike-and-wave discharges that are bilateral and symmetrical.

Myoclonic Seizures

Myoclonic seizures are characterised by abrupt, brief muscle jerks, which may be singular or occur in a series. The jerks are typically symmetrical and can result in the dropping of objects or even falls. These seizures are often seen in conjunction with various epilepsy syndromes and can be an early warning sign of a more severe seizure type developing.

Tonic-Clonic Seizures

The most dramatic and readily identified seizure type, tonic-clonic seizures involve an initial tonic phase with muscle rigidity, followed by a clonic phase with rhythmic muscle contractions. These

seizures are often preceded by a loud cry due to the forcible expiration of air from the lungs, followed by a loss of consciousness. The postictal phase may involve deep sleep, headache, confusion, and disorientation.

Atonic Seizures

Atonic seizures result in an abrupt loss of muscle tone, which often leads to falls and potential injury, hence the term 'drop attacks.' These seizures are particularly challenging to manage because of the suddenness and the risk of trauma. Protective headgear may be recommended for individuals with frequent atonic seizures to mitigate the risk of head injury.

Aetiological Classification

Epilepsy can also be categorised based on its **aetiology**, such as:

- **Structural**
- **Genetic**
- **Infectious**
- **Metabolic**
- **Immune**
- **Unknown Causes**

These aetiologies significantly influence the treatment and management of the condition.

Epilepsy Syndromes

In addition to seizure type and aetiology, **epilepsy syndromes** are recognised by a cluster of features that occur together, which can include:

- **Specific Seizure Types**
- **EEG Findings**
- **Age of Onset**

This concept is instrumental in directing specific management strategies.

Management Strategies for Epilepsy

The management of epilepsy is tailored to the individual, taking into account the type and frequency of seizures, epilepsy syndrome, and the patient's lifestyle and overall health. The overarching goal is to achieve seizure control with minimal side effects to enable a normal life as far as possible.

Pharmacotherapy

Anti-seizure medications (ASMs) are the mainstay of epilepsy treatment. The choice of ASM is guided

by several factors:

- **Seizure Type**
- **Epilepsy Syndrome**
- **Patient Age and Sex**
- **Comorbid Conditions**
- **Potential Side Effects**
- **Patient's Personal Circumstances**

Monotherapy is often the initial strategy, with combination therapy considered if monotherapy fails.

Drug-Resistant Epilepsy

In cases of drug-resistant epilepsy, alternative treatment strategies are considered:

- **Surgical Options**: Resection, disconnection procedures, or hemispherectomy.
- **Pre-surgical Evaluation**: To assess the potential benefits and risks.

Neurostimulation Techniques

For those unsuitable for surgery, neurostimulation presents an alternative:

- **Vagus Nerve Stimulation (VNS)**
- **Deep Brain Stimulation (DBS)**
- **Responsive Neurostimulation (RNS)**

These techniques use electrical impulses to reduce seizure frequency and severity.

Dietary Therapies

Specific dietary modifications have proven effective, especially in children:

- **Ketogenic Diet**: A high-fat, low-carbohydrate diet.
- **Modified Atkins Diet**
- **Low Glycaemic Index Treatment**

Psychosocial Interventions

Addressing the psychological and social aspects is crucial:

- **Improvement of Mental Health**
- **Social Integration**
- **Enhancement of Quality of Life**

Regular Follow-up

Monitoring and adjusting treatment over time is necessary due to:

- **Treatment Efficacy**
- **Side Effects**
- **Changes in Patient's Condition**

Management must be individualised and often requires a multi-disciplinary approach. Regular review and adaptation to the patient's changing needs are essential for optimal outcomes.

The continuous evolution of precision medicine and ongoing research promise more targeted and effective treatments for epilepsy.