

Investigations

Electroencephalogram (EEG)

- EEG records the electrical activity of the brain.
- EEG is a non-invasive and widely available investigation for evaluating an individual with suspected seizures. EEG is not a substitute for a good clinical history but can add to the value of the diagnosis.
- An EEG should be obtained, whenever there is uncertainty regarding the nature of seizure, epilepsy type or epilepsy syndrome.
- Routine EEG is useful for diagnosis, classification of seizure type and the epilepsy syndrome. It is also useful for predicting seizure recurrence after the first seizure.
- There are better chances of detecting abnormalities if EEG is done soon after the seizure or within 48 hours.
- Epileptiform discharges (ED) in the EEG may occasionally be seen among healthy adults without history of seizures.

A normal EEG does not rule out the diagnosis of epilepsy.
EEG should always be interpreted keeping in mind the clinical situation.

Video EEG (VEEG)

- Long term VEEG is a time consuming and relatively expensive method of investigating patients with difficult to control epilepsy. It involves continuous video and synchronized EEG recording done usually for more than 24 hours with documentation of at least 3 or more events. The VEEG is also used in differential diagnosis of the type of seizures, especially when nonepileptic events are suspected. A short term VEEG (1-2 hours) may be performed in patients in whom psychogenic non-epileptiform events are suspected. It is also useful in patients who have frequent and several episodes in a day.
- Long term VEEG should be carried out in centres having the expertise to perform this procedure.
- Brain mapping of EEG frequencies is not routinely required in clinical practice.
- There are better chances of detecting abnormalities if EEG is done soon after the seizure or within 48 hours.

NEUROIMAGING IN EPILEPSY

- Neuroimaging (CT or MRI scan of the brain) is not mandatory for all PWE.
- Neuroimaging in epilepsy is useful in:
 - Focal seizures
 - Seizures suspected to be symptomatic in origin.
 - Difficult to control seizures (MRI using special epilepsy protocol).
- The rationale for use of neuroimaging in epilepsy is to identify pathologies such as granulomas, malformations, vascular or traumatic lesions, tumors and other congenital etiologies like tuberous sclerosis and cortical dysplasias.
- CT head is useful in evaluation of seizures secondary to acute situations such as head injury, intracranial hemorrhage, infarcts or encephalitis.
- In acute settings most of the lesions can be picked up by CT as MRI may be technically difficult.
- MRI may be needed if CT scan is negative or inconclusive like in suspected cases of encephalitis.
- When imaging shows a single ring enhancing lesion a repeat imaging may be needed after 3 to 6 months or as the clinical situation demands.
- MRI is a better diagnostic modality and may be useful in most patients with difficult to control seizures and those suspected to have a structural lesion.

PRACTICE POINTS

- CT scan should be the initial investigation in epilepsy patients in our country.
- MRI may be performed taking into consideration the patient's socioeconomic status and type of epilepsy.
- Advanced epilepsy protocols and newer imaging modalities (fMRI, SPECT, PET) should be performed and interpreted by those working in specialized centres.

Algorithm for investigations of a patients presenting with seizures

