EEG IN THE DIAGNOSIS AND MONITORING OF EPILEPSY IN ADULTS

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CLINICAL UTILITY OF EEG IN EPILEPSY

Electroencephalography (EEG) is an essential tool in the evaluation and management of People with Epilepsy (PWE).

Standard scalp EEG represents the combined electrical activity of billions of neurons, but records only one-third of the cerebral cortex.

A standardized protocol for EEG (including activation procedures) should be used to ensure reproducibility from one recording to another.

Continuous EEG (cEEG) in special care units can quantify clinical/subclinical seizures for diagnosis and assist in the management of seizure emergencies, including status epilepticus.

CLINICAL UTILITY OF EEG

- First seizure or clinical suspicion of epilepsy
  - Standard EEG including activation methods
  - Sleep/sleep deprived EEG
    - Normal or unrevealing
    - Sleep EEG
      - Abnormal recording
    - Overnight Ambulatory EEG with video or video EEG monitoring
  - Frequent events

- Seizure classification or quantification
  - Long-term video EEG monitoring
    - Discordant data
    - Intracranial EEG, Cortical Stimulation, functional mapping
  - Presurgical evaluation

- Definitive diagnosis
  - Suspicion of subclinical sz/loss of consciousness
    - Standard EEG, followed by cEEG or repeated standard EEG
  - Suspicion of focal unaware sz or frequent generalized seizures

TAKE-HOME MESSAGES

- The presence of IEDs in a standard EEG predicts a high risk of recurrence following a first seizure.
- The presence of IEDs in a standard EEG in patients with controlled epilepsy may predict a higher risk of seizure relapse following Antiseizure Drugs (ASD) taper.
- EEG helps classify seizure type (focal or generalized) when IEDs are encountered in the recording.
- Video-EEG monitoring can provide a definitive diagnosis in most PWE when seizures are recorded.
- Video-EEG monitoring is useful in an epilepsy surgery evaluation.
- cEEG monitoring is a useful adjunct to diagnosing and quantifying seizures, especially in critically ill patients.