Epilepsy in the Adolescent Population

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Epilepsy diagnosis

Basic approach

- Is the epilepsy focal or generalized?
  - Semiology
  - EEG features
- Diagnostic workup to identify etiology of seizures and epilepsy syndrome
  - Structural
  - Metabolic
  - Genetic

Epilepsy diagnosis: Relevance to adolescent population

- Current operational clinical definition of epilepsy: At least 2 unprovoked (or reflex) seizures occurring > 24 h apart
  - Unprovoked seizure definition
  - Provoked seizure definition
- Recurrent reflex seizures in response to photic stimulation
- Diagnosis of a specific epilepsy syndrome after a single seizure

Epilepsy classification

1. Localization-related epilepsy in adolescents
   - Non-lesional focal epilepsy: 20-30%
   - Lesional focal epilepsy: 20-30%
   - Pharmaco-resistant epilepsy: 20%

2. Idiopathic generalized epilepsy (IGE)
   - IGE constitutes 15-20% of all epilepsies in adults and children
   - Classification of the electroclinical syndrome based on:
     - Seizure types
     - Age of onset

    - EEG characteristics
- Electrographic signature of IGE:
    - Interictal and ictal discharges
    - Normal background
    - Photoparoxysmal response
    - Atypical features
    - Fragments of generalized discharges

IGE subtypes in the adolescent population

A. Juvenile Absence Epilepsy
    - Clinical features
        - Age at onset
        - Seizure types
    - EEG features
        - Generalized spike wave with faster frequency
        - Polyspikes
        - Activation procedures
    - Treatment
        - valproate
        - lamotrigine
        - ethosuximide may be effective for absences only
    - Prognosis
        - Typically lifelong

B. Juvenile Myoclonic epilepsy
    - Clinical features
        - Age at onset
        - Seizure types
    - EEG features
        - Generalized 4-6 Hz polyspike and polyspike-wave discharges
        - Correlate with a myoclonic jerk
        - Photoparoxysmal response in up to half of cases
    - Treatment
        - Valproate with high efficacy (use limited in women)
        - Lamotrigine is often first choice (may worsen myoclonic seizures)
        - Others: topiramate, levetiracetam, zonisamide
        - Carbamazepine, phenytoin, vigabatrin can worsen seizures

- Prognosis
  - Most cases are pharmaco-responsive
  - Lifelong therapy
  - Percentage achieving remission off medication

C. Generalized tonic-clonic seizures upon awakening (GTCA)/Epilepsy with Grand Mal Seizures upon awakening (EGMA)
   - Clinical features
     - Age at onset
     - Seizure types
   - EEG features
     - Generalized spike-wave discharges
     - Polyspikes
     - Photoparoxsymal response

D. Genetic Generalized Epilepsy NOS
   - IGE subgroups not recognized by the ILEA
   - All exhibit EEG features similar to classic IGE
   - Distinct sub-syndromes
     - Perioral myoclonia with absences (onset 2-13 yrs)
     - IGE with phantom absences (onset of first GTC in adulthood)
     - Jeavons syndrome (typically presents in childhood)
     - Adult onset IGE (onset at > 18-20 years)

Non-epileptic Paroxysmal Events in the Adolescent Population

A. Syncope
   - Most common non-neurologic mimic of epilepsy
   - Vasovagal syncope most common
   - EEG findings during a syncopal event

B. Parasomnias
   - REM sleep behavior disorder
     - Clinical features
   - Non-REM sleep parasomnias
     - Clinical features
     - EEG features
       - Comparison to nocturnal (epileptic) seizures

- Clinical features
- EEG features

C. Psychogenic Non-epileptic Spells
   - Diagnosis of psychogenic non-epileptic spells
     - Historical features
     - Clinical features differentiating them from epileptic seizures
     - Semiology of childhood psychogenic non-epileptic spells
     - EEG features that support the diagnosis of non-epileptic spells

Treatment adherence in the adolescent population

Factors affecting adherence:
- in adults
- versus in adolescents

Potential solutions to barriers to medication adherence
- Internet based programs
- Smartphone applications

Psychosocial considerations in adolescents with epilepsy
- Driving
- Sports
- Emerging independence
- Parental protection

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