



# Misinterpretation of EEG/video- EEG in generalized epilepsies

**Elza Márcia Yacubian**

**Unidade de Pesquisa e Tratamento das Epilepsias**

**Hospital São Paulo**

**UNIFESP, São Paulo, Brazil**

**yacubian@terra.com.br**

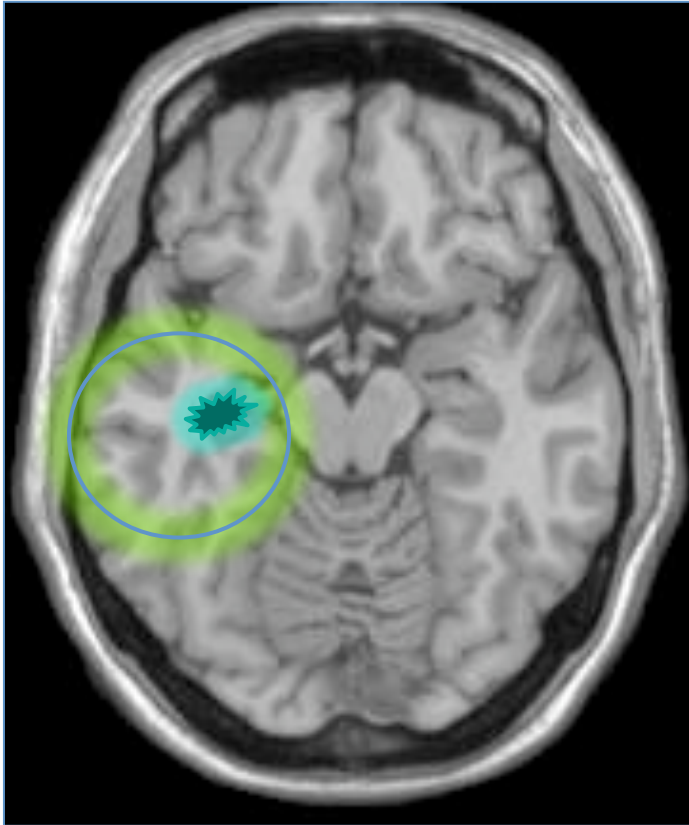
# Disclosure

- None

# Learning objectives

- Concept of generalized epilepsies
- Methods of activation of epileptiform discharges
- Atypical EEG findings in IGE
- Atypical clinical characteristics in IGE

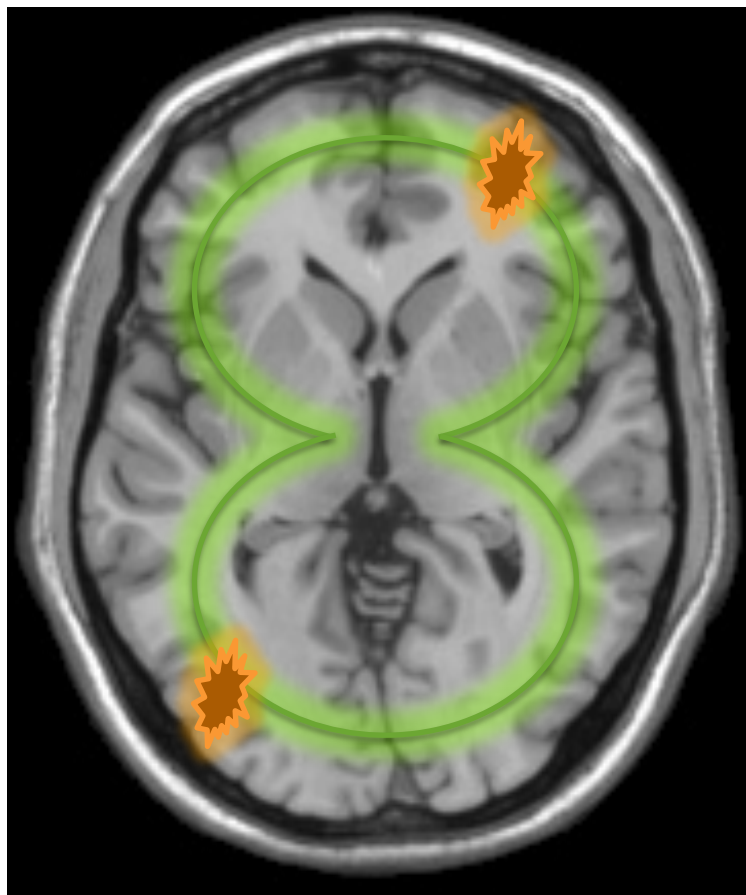
# Focal seizures



- Those arising from networks confined to a single cerebral hemisphere

Berg et al. Epilepsia 2010;51(4):676-85

# Generalized seizures



- Generalized seizures originate at some point of a neuronal network and rapidly engage bilateral networks;
- Such bilateral networks can engage cortical and subcortical structures but do not necessarily include the entire cortex;
- Although individual seizure onsets can appear localized, the location and lateralization are not consistent from one seizure to another;
- Generalized seizures can be asymmetric.

Berg et al. *Epilepsia* 2010;51(4):676-85

# Misinterpretation of EEG/video-EEG in generalized epilepsies

- Mistakes in recording methodology:
  - Mistakes in hyperventilation
  - Mistakes in photic stimulation
    - Mistakes in employment advice
    - Mistakes in epilepsy treatment
- Mistakes in EEG interpretation
- Mistakes in seizure semiology

# MISTAKES IN RECORDING METHODOLOGY

## Hyperventilation

# MISTAKES IN RECORDING METHODOLOGY

## Photic stimulation



# MISTAKES IN EMPLOYMENT ADVICE

# MISTAKES IN EPILEPSY TREATMENT

# Scoring table photic stimulation

Name:

Date of birth:

Date:

Medication:

Time:

Flash frequency (Hz)	1	2	8	10	15	18	20	25	40	50	60
Eye condition											
Eye closure	-	-	+	0	0	0	0	0	+	-	-
Eye closed	-	-	±	±	+	0	+	±	-	-	-
Eyes open	-	-	-	-	±	+	±	-	-	-	-

In this scoring table, an example is given of determination of the three photosensitivity ranges based on the proposed methodology. Photosensitivity ranges: eye closure: 8-40 Hz; eyes closed: 15-20 Hz; eyes open: 18 Hz. Explanation codes +: generalized epileptiform discharges; ±: epileptiform discharges, not generalized; -: no epileptiform discharges; 0: frequency not tested

Kasteleijn-Nolst Trenité et al. *Epilepsia* 2012;53(1):16-24

# Practical conclusions regarding photosensitivity range

- Never remove AEDs in patients with photosensitivity without studying the photosensitivity range during withdrawal and especially after the complete withdrawal of AEDs.

# MISTAKES IN INTERPRETATION OF EEG

## Atypical signs in EEG of IGE

# Atypical EEG abnormalities

1. Amplitude asymmetry of paroxysms and fragments;
2. Focal onset of paroxysms;
3. Focal offset of paroxysms;
4. Abnormal morphology of paroxysms;
5. Generalized paroxysmal fast rhythm

# MISTAKES IN INTERPRETATION OF SEIZURES SEMIOLOGY

Atypical semiological signs in  
seizures of IGE

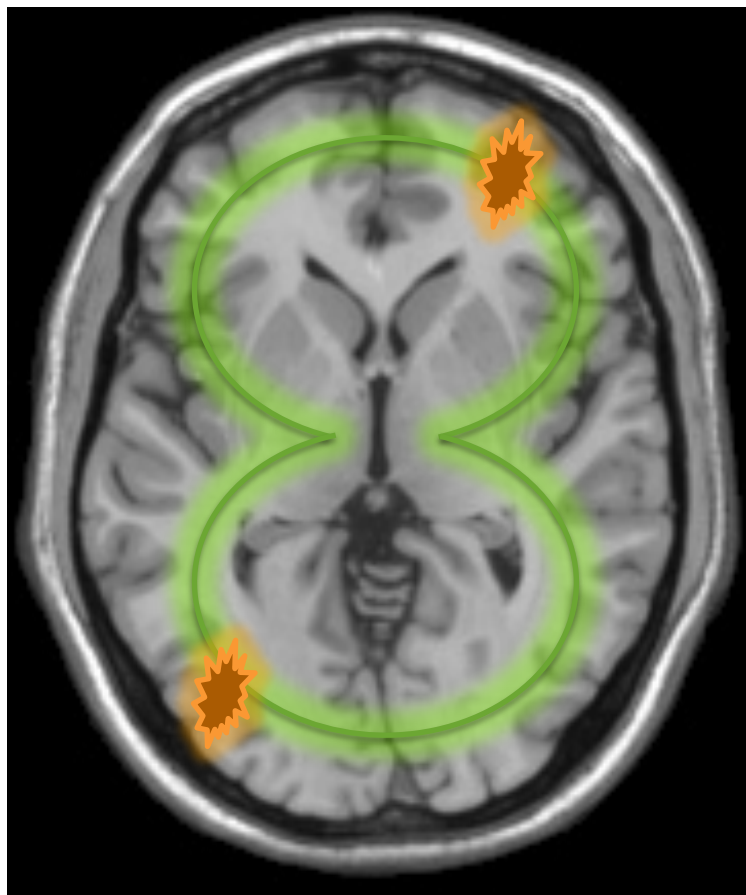
# Auras



# Head and eyes version

# Asymmetry of limb myoclonia

# Generalized seizures



- “Generalized” is a misnomer. This has been a component of the debate over seizure classification, with the term “generalized” now recognized as not truly generalized but “occurring in and rapidly engaging bilaterally distributed networks”

Berg et al. *Epilepsia* 2010;51(4):676-85

# Conclusions

- A careful methodology is necessary when obtaining EEG/video EEG recordings;
- Focal features in EEG and seizure semiology may result in misdiagnosis and delayed diagnosis in IGEs;
- As a consequence, the patient may receive an inappropriate AED, leading to poor seizure control.

# References

1. Berg AT, Berkovic SF, Brodie MJ, Buchhalter J, Cross JH, van Emde Boas W, Engel J, French J, Glauser TA, Mathern GW, Moshé SL, Nordli D, Plouin P, Scheffer IE. Revised terminology and concepts for organization of seizures and epilepsies: report of the ILAE Commission on Classification and Terminology, 2005-2009. *Epilepsia*. 2010;51(4):676-85.
2. Kasteleijn-Nolst Trenité D, Rubboli G, Hirsch E, Martins da Silva A, Seri S, Wilkins A, Parra J, Covanis A, Elia M, Capovilla G, Stephani U, Harding G. Methodology of photic stimulation revisited: updated European algorithm for visual stimulation in the EEG laboratory. *Epilepsia*. **2012**;53(1):16-24
3. Seneviratne U, Woo JJ, Boston RC, Cook M, D'Souza W. Focal seizure symptoms in idiopathic generalized epilepsies. *Neurology* 2015;85(7):589-95.
4. Seneviratne U, Cook M, D'Souza W. Focal abnormalities in idiopathic generalized epilepsy: a critical review of the literature. *Epilepsia* 2014;55(8):1157-69.
5. Seneviratne U, Cook M, D'Souza W. The electroencephalogram of idiopathic generalized epilepsy. *Epilepsia*. 2012;53(2): 234-48.
6. Usui N, Kotagal P, Matsumoto R, Kellinghaus C, Lüders HO. Focal semiologic and electroencephalographic features in patients with juvenile myoclonic epilepsy. *Epilepsia* 2005;46(10):1668-76.