

Epilepsy and epileptic seizures I.



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Definition of epileptic seizure

- Objective or subjective clinical symptom(s)
- Cause: abnormal synchronous activation of a brain neuronpopulation

Epileptic seizure \neq Epilepsy

Definition of epilepsy

- Recurrent
- Spontaneous (not provoked and not caused by serious acute illness)
- Epileptic seizures

Differential-diagnostic questions of epilepsy and epileptic seizures

Prevalence of epilepsy: 0.6-0.8%

5% of the total population had once a seizure in his/her life

10-20% of the total population undergo various diagnostic procedures due to suspicion on epilepsy:

Two main differentialdiagnostic questions:

1. Did the patient have an epileptic seizure?
(„Differentialdiagnosis”)
2. If yes: Is it an epilepsy? (Diagnosis)

Is it an epileptic seizure? („Differential-diagnosis”)

1. Metabolic disorders (hypoglycemia)
2. Transient ischemic attack (TIA) (negative symptoms!, > 10 min)
3. Migraine (the aura phase is > 10 min starts and ends slowly and gradually and the aura is followed by headache)
4. Sleep disorders: Hypersomnias (narcolepsy), Parasomnias (night terror, sleep walking)

4. Psychiatric disorders:

Pseudoseizure = Non-epileptic psychogenic seizures

5. Syncope: Seizures with falls

The two most important differential-diagnostic problems:

- 1. First seizure in life: Epileptic seizure vs. Syncope (loss of consciousness due to lowering of CBF)**
- 2. Recurrent seizures: epileptic seizures vs. Psychogenic seizures**

The two main tools in differential diagnosis:

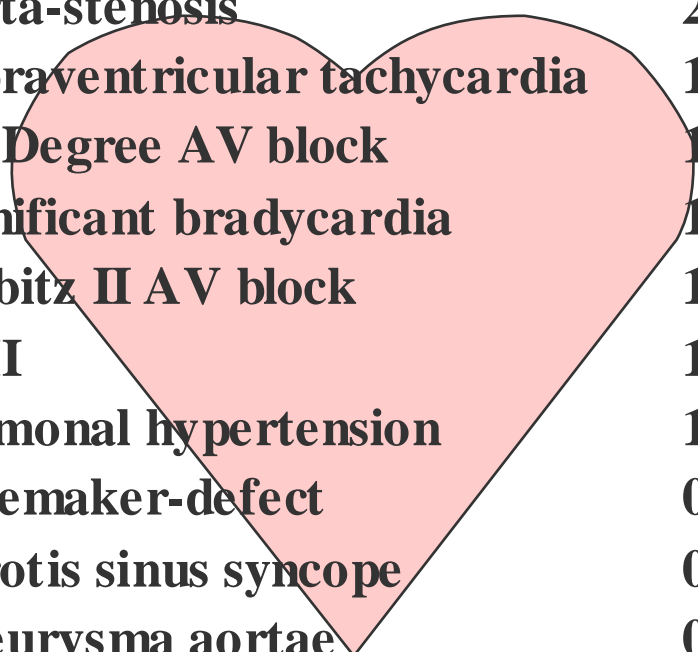
- 1. Heteroanamnesis (eyewitness)**
- 2. Autoanamnesis**

Syncope

- Cause: transient hypoperfusion of the brain
- Diagnostic tools: Patient's history, heteroanamnesis, Echocardiography, Holter-ECG
- Convulsive syncope (>10s generalized decrease of brain perfusion)
 - : 1-3 jerks, small tonic contractions. Occasionally tongue biting and enuresis(!), sometimes a lateral or vertical deviation of bulbi
- Differential diagnosis convulsive syncope from GM:
 1. Syncope may be preceded by „presyncopic” symptoms („I felt I would faint”,)
 2. ABSENCE OF a LONGER TONIC PHASE (unlike epileptic sz.)
 3. Only 2-3 jerks
 4. < 20 seconds (epileptic seizure lasts 0.5-2 min)
 5. No postconvulsive confusion
- Often Cause of convulsive syncope: SSS (long-term ECG!)

Causes of the Syncope

Cardiovascular 26%



Ventricular Tachycardia	10%
SSS	5%
Aorta-stenosis	2.5%
Supraventricular tachycardia	1.5%
III. Degree AV block	1.5%
Significant bradycardia	1%
Mobitz II AV block	1%
AMI	1%
Pulmonal hypertension	1%
Pacemaker-defect	0.4%
Carotis sinus syncope	0.4%
Aneurysma aortae	0.4%
Pulmonal emboli	0.4%

Non-cardiovascular 26%

Situative syncope	7%
Orthostatic hypotension	7%
Vasodepressive syncope	4%
Drug-induced (antiarrhythmic, or antihypertensive drugs)	3%
TIA	1.5%
Epileptic seizures	1.5%

Unknown 48%

„Pseudoseizure” = „psychogenic non-epileptic seizure” = „hysteric seizure”

- onset: early adulthood
- women:men 3:1
- The most common cause of „status epilepticus” in adulthood (a very common diagnostic mistake in intensive units)

Pseudoseizures: Differential diagnosis is often difficult may require video-EEG monitoring

- Usually longer (minutes, half an hour) than epileptic seizures
- Show a great variability (no stereotypia)
- Long-lasting bilateral motor phenomena with unimpaired consciousness is very unusual in epilepsy
- Postictal confusion, lateral tongue biting, enuresis, nocturnal occurrence is rare in pseudoseizures (these are the features of epileptic seizures)
- Psychiatric disorder („conversion-disorder”)

Differential-diagnosis of falling seizures

	Impaired consciousness	Motor phenomena	Eyes	Tongue biting	Enuresis	End of the seizure
Syncope	Yes > 5sec CBF↓	Usually not but: 2-3 Convulsions if > 10 sec CBF↓	Usually open	Rare	Rare	Fast
Pseudo-seizure (psychogenic seizure)	Partly impaired (pain reaction)	Changeable, bilateral motor phenomena with unimpaired awerness	Usually closed or if they are open then: blinking	Rare	Very rare	Changeable + emotional component
Epileptic (Grand mal) seizures	Impaired	Tonic-clonic component, showing a sequence	Open	Frequent (lateral)	Frequent	Postictal confusion

Differential-diagnostic questions of epilepsy and epileptic seizures

1. Is it an epileptic seizure? („Differential diagnosis”)
2. If it is an epileptic seizures, then: Is it an epilepsy?
(Diagnosis)

1. Epilepsy: 0.5%

2. Epileptic seizure: 5%

3. Susceptibility on epileptic seizures: 100%

First epileptic seizure in life

- **1. Acute symptomatic epileptic seizure** (a symptom of a serious acute disorder affecting CNS)
- **2. Provoked epileptic seizure** (caused by well-defined provoking factors and not by a disorder)
- **3. Isolated Epileptic Seizure** = First, unprovoked epileptic seizure without acute serious illness (It may be the first sign of an epilepsy)

Acute symptomatic epileptic seizures

- CNS infection (HSV encephalitis)
- CNS trauma (serious contusion, subdural hematoma)
- Brain sinus thrombosis (venous thrombosis)
- SAH
- Stroke
- Metabolic disorder (uraemia, hypoglycaemia-induced seizures)
- Intoxication

Provoked epileptic seizures

- Febrile seizures in childhood
- Sleep deprivation
- Alcohol- and drug withdrawal

Isolated Epileptic Seizure = First sign of an epilepsy or NOT?

- Epilepsy =
 - Recurrent (at least 2)
 - Unprovoked
 - Epileptic seizures

Most often causes of epilepsy

Genetics: 30-40%

Post-stroke

Benign brain tumor

Vascular malformations of the brain

Post-encephalitis

Malformations of cortical development (dysgeneses) Posttraumatic

Hippocampal sclerosis

Classification of epileptic seizures and epilepsies is extremely complicated

- Classification of epileptic seizures
- Classification of epileptic syndromes („epilepsies”)

Classification of epileptic seizures

- Partial (origin: circumscribed brain region)
 - Simplex
 - Motor (cloni, version)
 - Sensory (auras: somato-sensory, temporal auras)
 - Complex (loss of consciousness with oral and manual automatisms)
- Generalized
 - Absence
 - Myoclonic
 - Generalized tonic-clonic (grand mal seizure)

Classification of epileptic seizures

■ Partial

● Simplex

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Simplex aura

- Somatosensory aura (hemi-paresthesia)

Auras origin from temporal lobe:

- Gastric sensation
- De ja vu, jamais vu
- Smell-sensation („uncinatory seizures”)

Auras usually but not always may be preceded by complex partial seizures (loss of consciousness) or generalized (grand mal) seizures)

Simplex motor seizures

(depends on the activated brain region):

- **Clonic seizures (Jackson seizures)**
- **Tonic seizures**
- **Versiv seizures**

seizures

/psychomotor seizures/

Classification of epileptic seizures

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■ Generalized

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Generalized tonic-clonic seizure:

- it may be primer,
- But can be preceded by any other seizure types. („secondarily generalized seizure”: final common pathway)
- sequence: tonic phase (with apnea), clonic phase,
- postictal confusion or postictal sleep
- Postictal examination (not obligate signs): tongue biting, enuresis, muscle pain, trauma, Todd paresis

Epilepsy syndrome = a chronic condition with a typical symptoms

- Typical seizure type
- Typical etiology (genetics vs. Acquired)
- Typical localisation of the seizure focus in the brain (circumscribed or non-localisable)
- Typical age at onset

Classification of epilepsy syndromes

Two main axis:

- Genetical or acquired
- Focal (localisation-related) or generalized

Focal epilepsy

**Benign centro-temporal
epilepsy**

Idiopathic (genetical) epilepsies

Non-idiopathic epilepsies (symptomatic, cryptogenic)

**Temporal lobe epilepsy
Frontal lobe epilepsy
Parietal lobe epilepsy
Occipital lobe epilepsy**

Generalized epilepsy

Absence epilepsy

Juvenile myoclonic epilepsy

Grand mal epilepsy on awaking

West syndrome

Lennox-Gastaut syndrome