

# Epileptic Seizure in Elderly People: Etiological Factors

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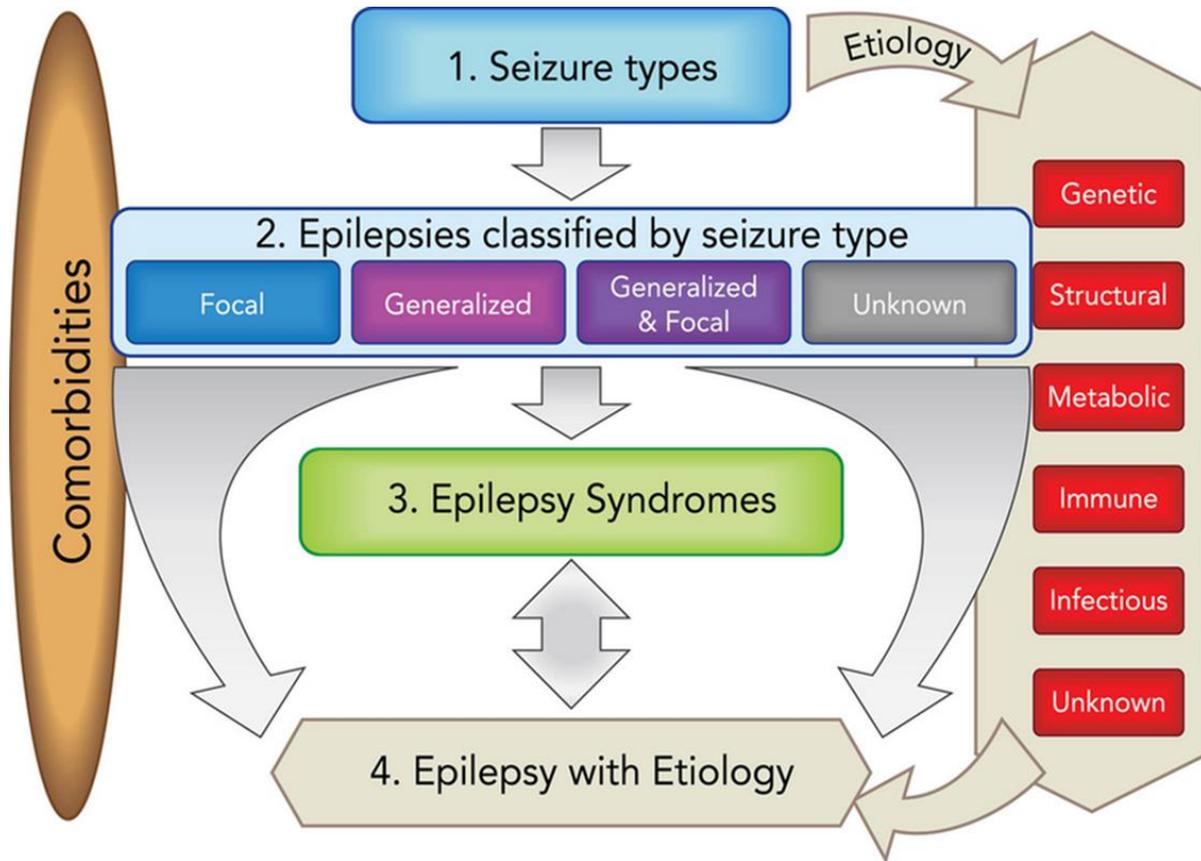
# Introduction

*Epileptic seizure* is a condition characterized by changes in consciousness, behavior and memory due to abnormal excessive and synchronous neuronal activity in the brain, giving various motor, sensory and autonomic signs and symptoms.

Epileptic seizures can be seen as

- **a symptom of epilepsy syndromes** or
- **due to structural, systemic, toxic or metabolic causes** affecting the central nervous system

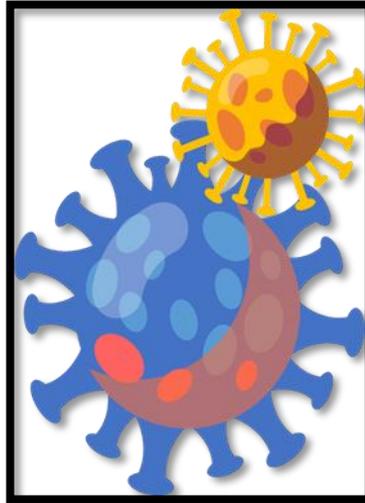




# Covid-19 as a trigger?

It is known that

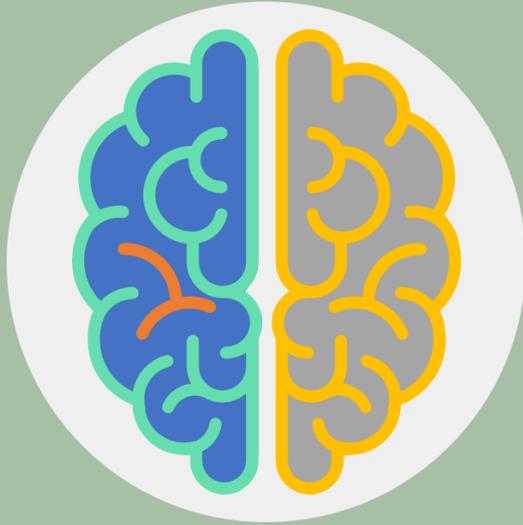
36% of Covid infected patients has neurological signs and symptoms



There are few studies on

- whether Covid-19 infection can cause worsening of seizures in patients with epilepsy or
- its ability to provoke acute symptomatic seizures in patients without a history of epilepsy

# Objectives

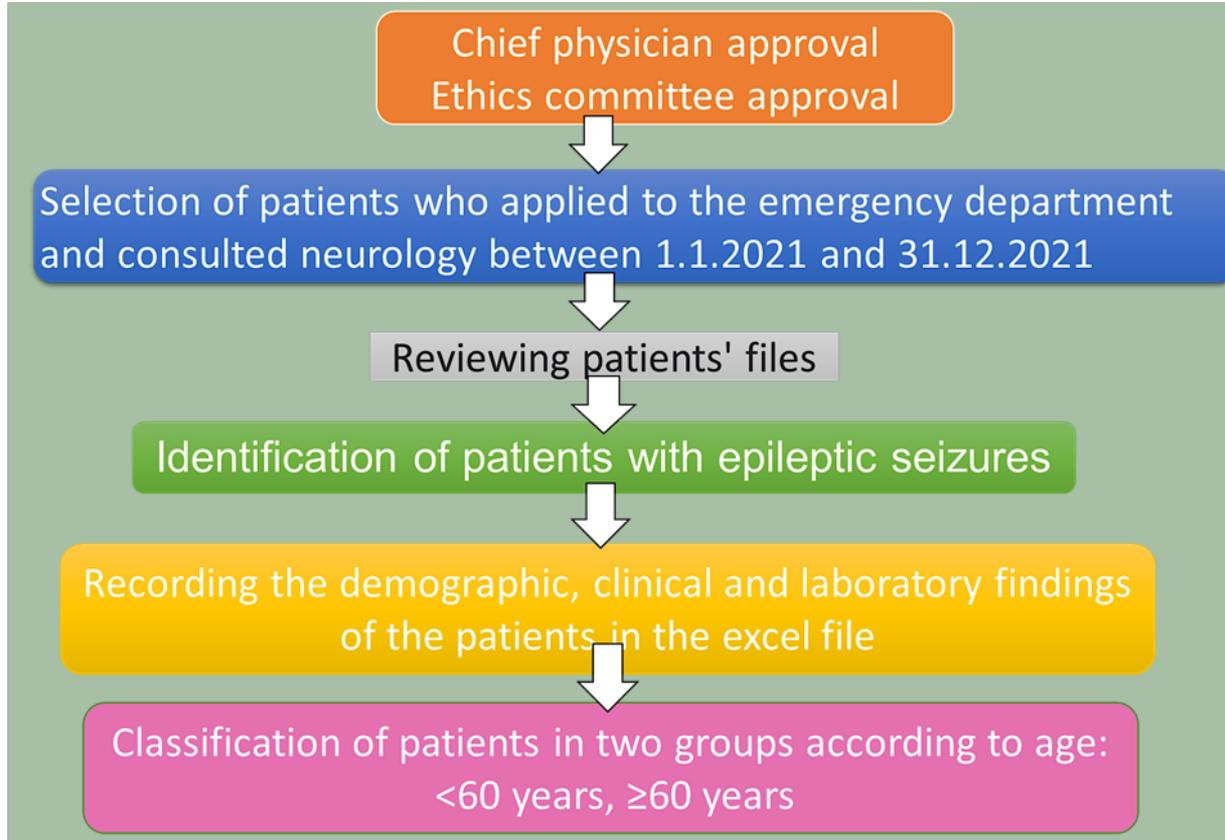


In this study, we aimed to examine

- the etiological factors of epileptic seizures and their relationship with age,
- the presence of seizures associated with Covid-19 infection or vaccines

in adult patients who admitted to the emergency department with epileptic seizures.

# Methods & Materials



# Documented Variables

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**Demographic data** : age, gender

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**Admission:** outpatient, by ambulance

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**History** : (epileptic seizure, febrile convulsion, syncope, epilepsy, family history for epilepsy)

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**Type of epileptic seizure** (focal /generalized /cryptogenic)

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**The course of the seizure in the emergency room** (duration, single seizure /recurrent seizure /status)

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**Seizure triggering factors** (infection, trauma, allergic reaction, disruption in drug use, stroke , etc.)

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**Medication**

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**Antiepileptic Drug usage** (regular/ irregular/ not using)

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**Comorbid diseases** (diabetes, hypertension, cerebrovascular disease, malignancy, autoimmune diseases, cardiac diseases, non- epilepsy neurological diagnosis)

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**Imaging studies:** cranial CT/MR findings

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**Scans for Covid:** Covid PCR result, Covid-19 IgG and IgM

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**Blood gas results,** lactate level

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**Biochemistry:** Glucose , Na , K, Ca , Mg, Albumin , CK, LDH, AST, ALT, BUN, creatinine

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**Complete blood count:** Htc , Hb , leukocytes

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**Infection markers:** Sedimentation, CRP, procalcitonin

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**Complete urinalysis** (pyuria, bacteriuria)

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**ECG** recording

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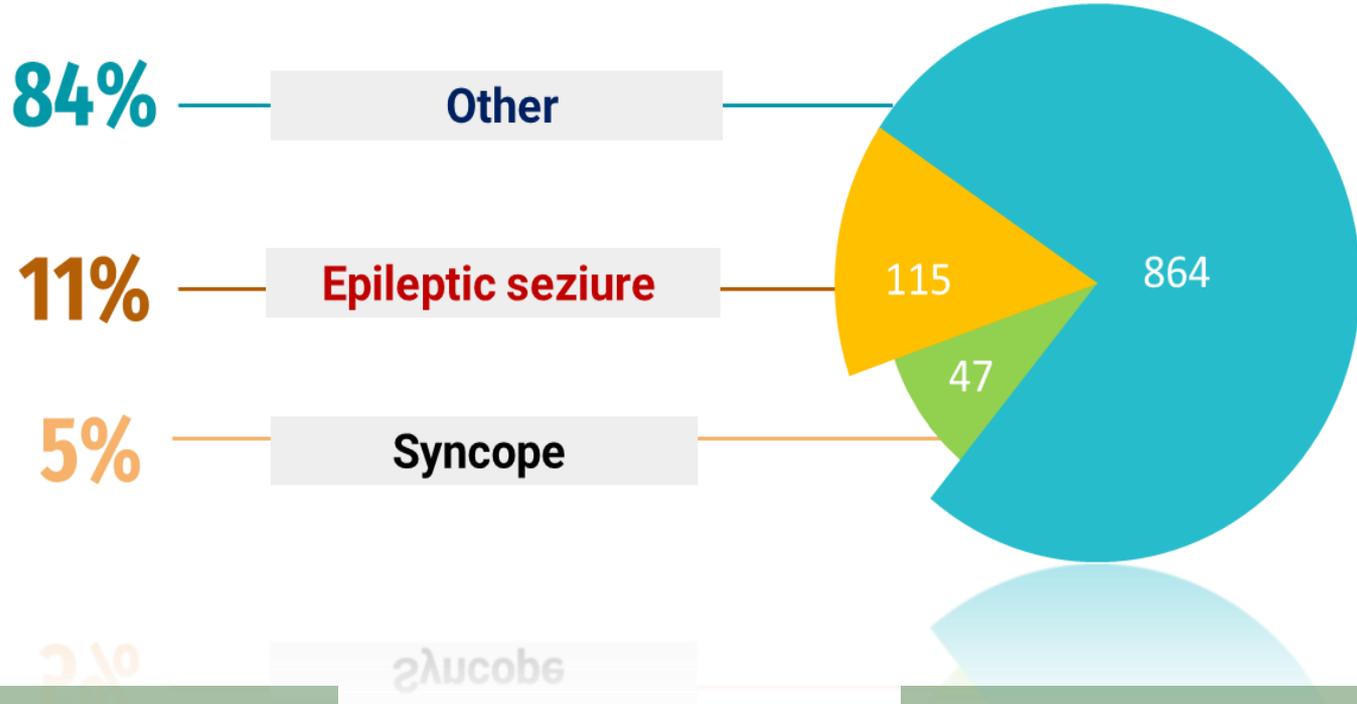
**EEG** findings (basic activity, presence of epileptiform anomaly)

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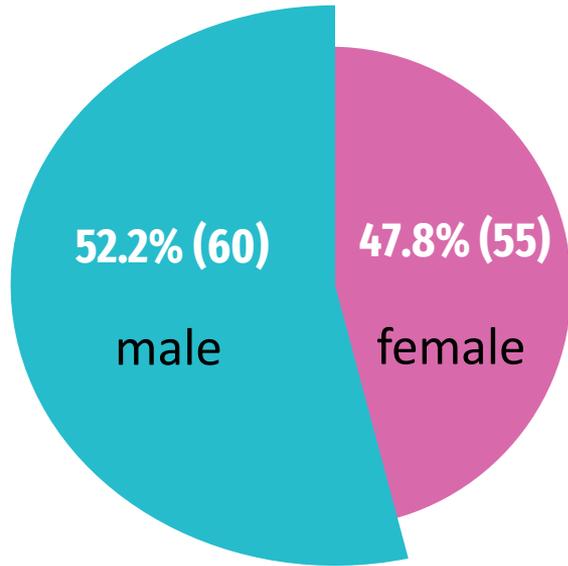
**Clinical follow-up** (recovery/discharged - epilepsy diagnosis/follow-up-death)

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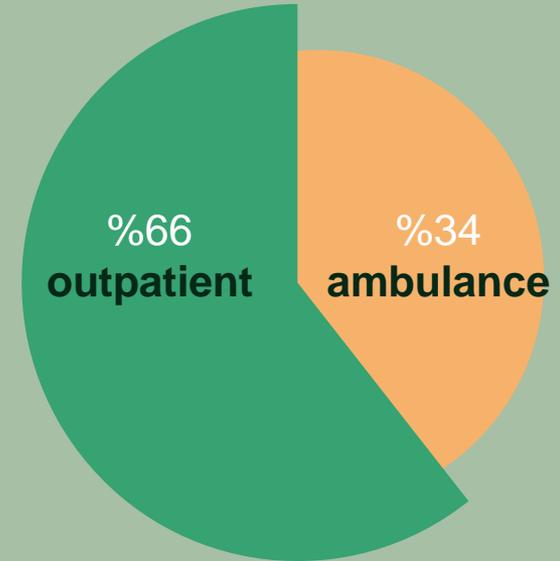
# Results



## Gender



## Admission



# Seziure Type

6%

Focal- aware



16%

Focal – non –  
conscious



76%

Generalized non-  
conscious

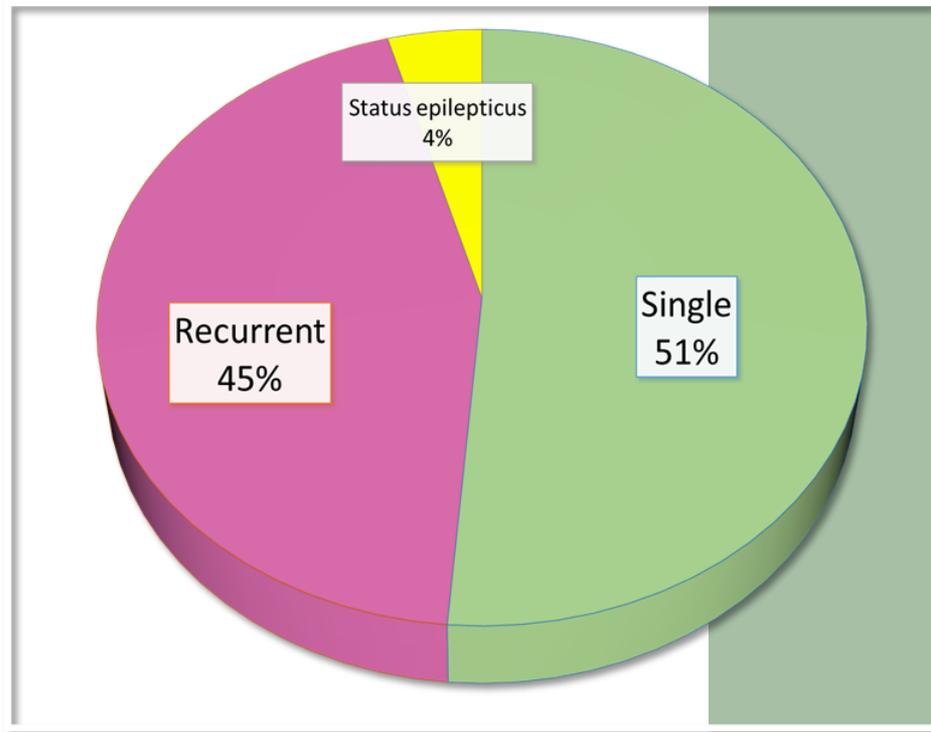


2%

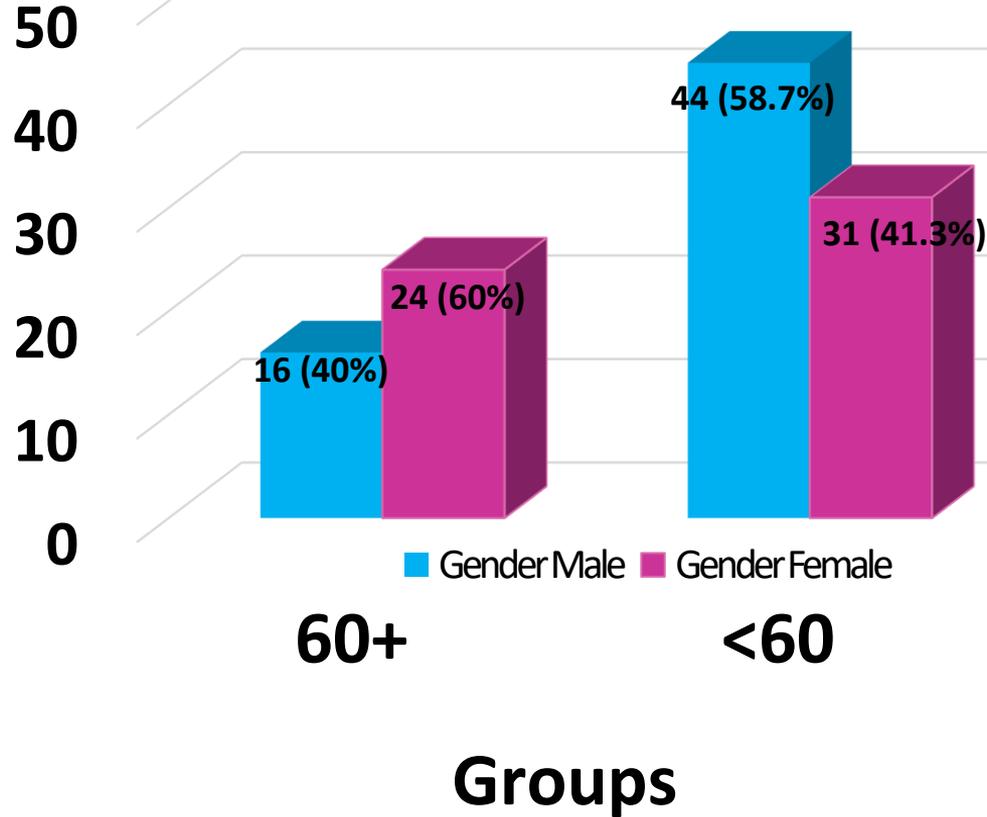
Generalized –  
aware



# Course of seziure

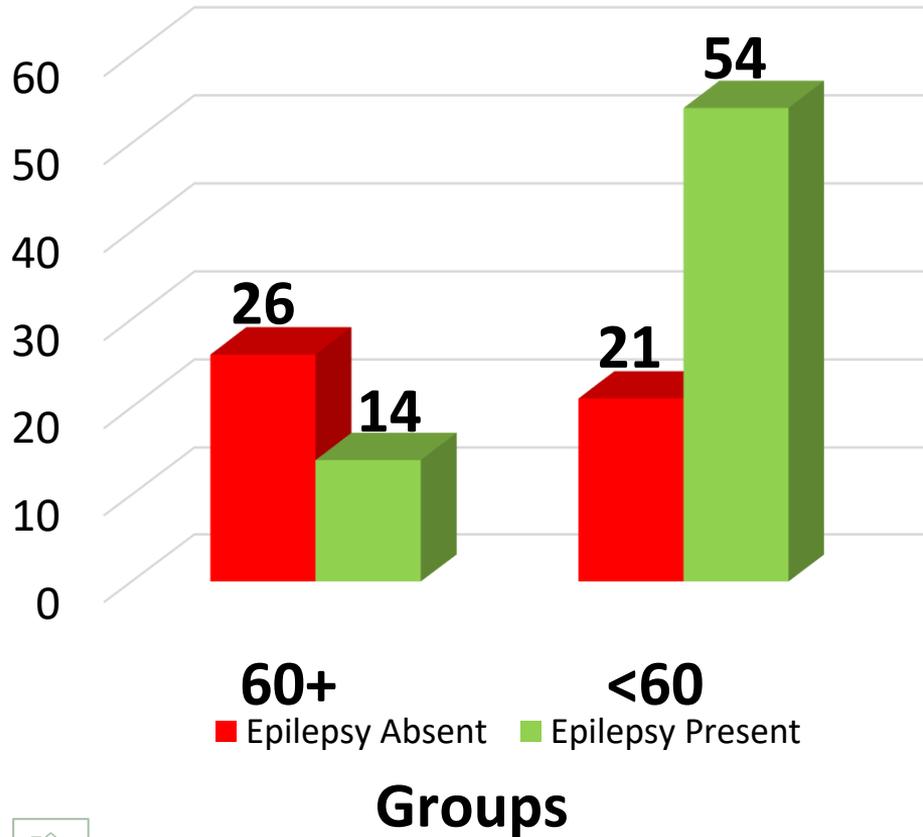


## Distribution of groups by age



Group 60+  
N=40  
Group <60  
N=75

## Previous diagnosis of epilepsy



Previous  
epilepsy  
60+ :35%  
<60 : 72%

$P < 0.001$



## Patients with previous diagnoses

60+

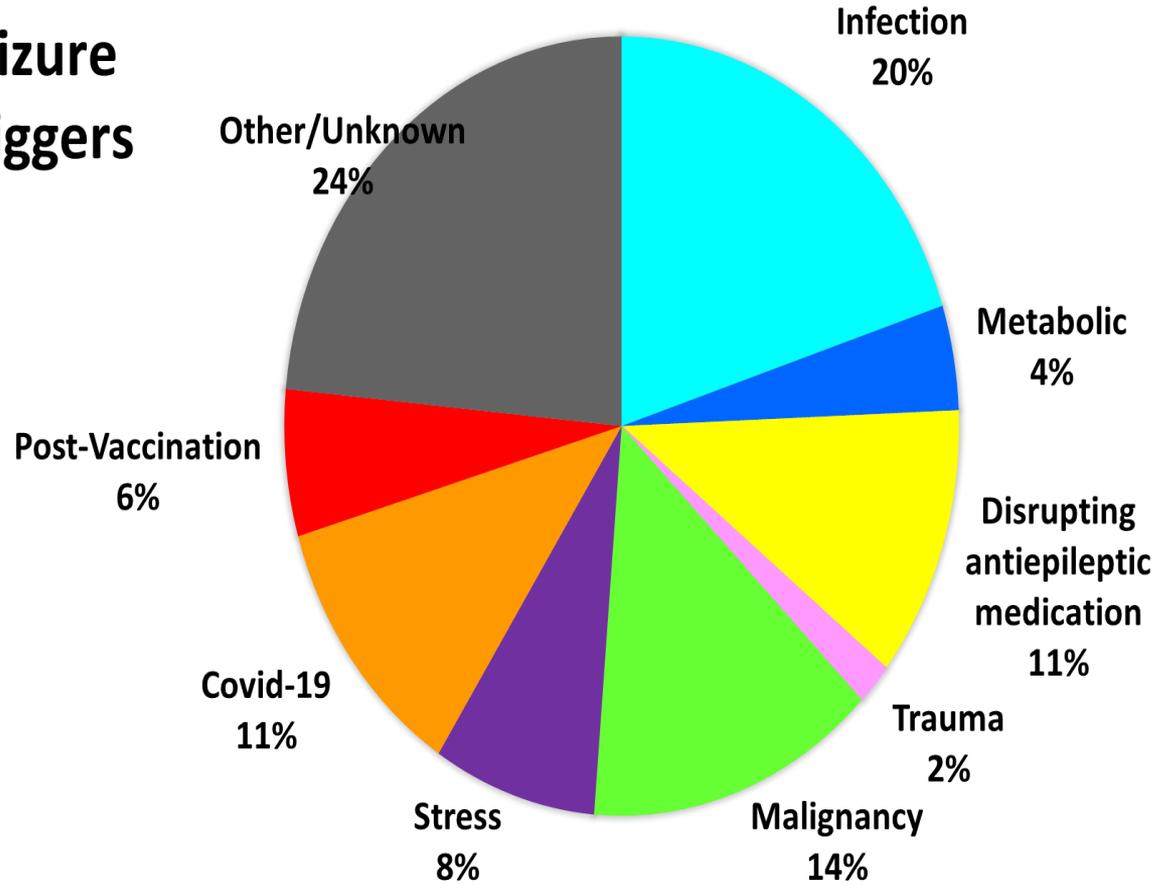
- Cerebrovascular disease: 8
- Genetic: 3
- Neurodegenerative disease: 1
- Brain tumor: 1
- Brain metastasis: 1

<60

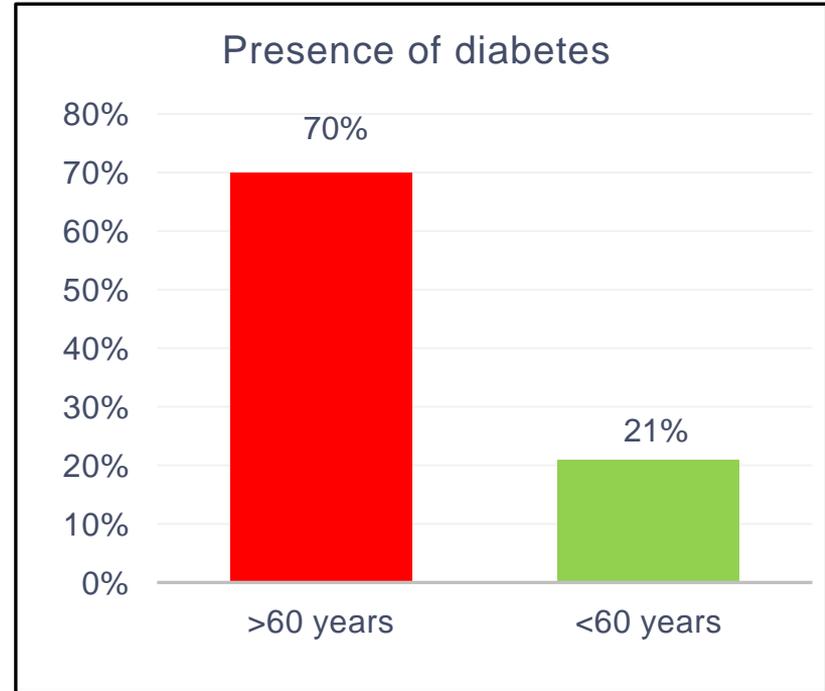
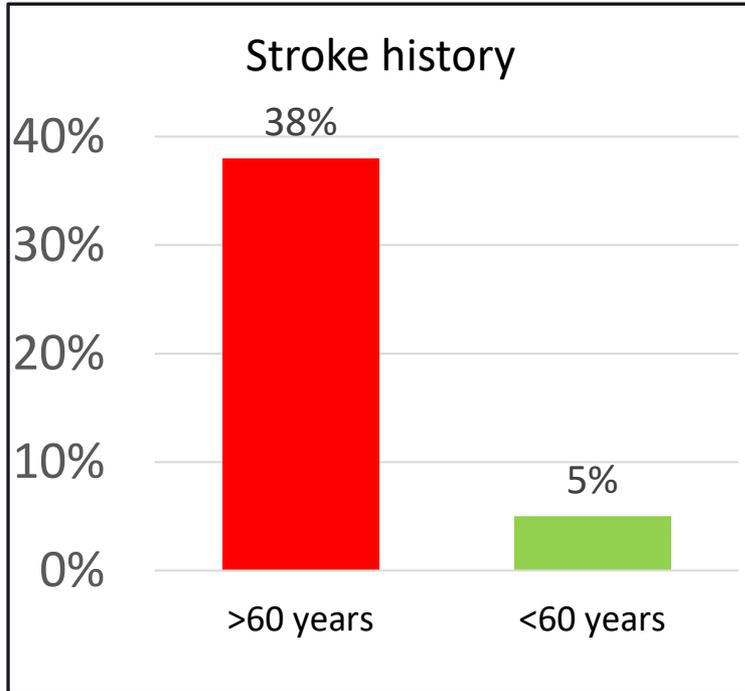
- Cerebrovascular disease: 2
- Genetic: 28
- Meningitis sequel/cerebral palsy: 10
- Brain tumor: 6
- Brain metastasis: 4
- Hydrocephaly: 2
- MELAS: 1
- Tuberculous meningitis: 1

- 1- Covid /infection
- 2-Unknown causes
- 3-Malignancy
- 4- Medication interruption
- 5- Stress
- 6- Post- vaccination
- 7- Metabolic
- 8- Trauma

## Seizure Triggers



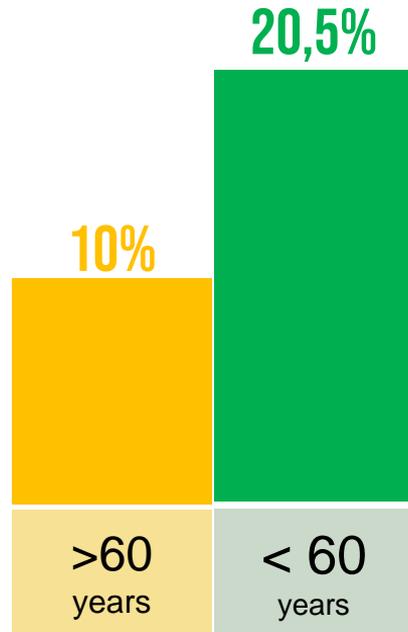
According to patient's histories



## Presence of:

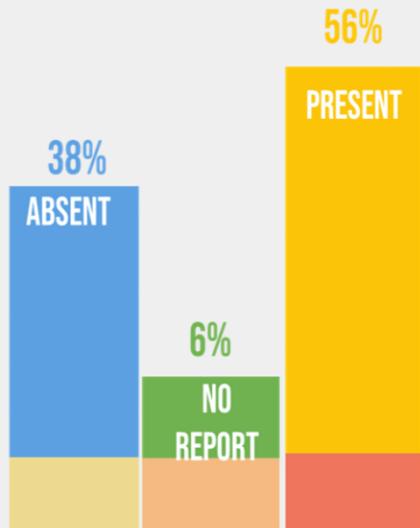
- **Brain tumor** → %20 (23/115 (16 of them primary, 7 of them metastasis))
- **Other malignancies** → %11 (13/115)
- **Neurodegenerative diseases**  
(Parkinson/Alzheimer/dementia ) → %9,5 (11/115)
- **Previous psychiatric diagnosis** ( schizophrenia, anxiety, autism ) → %7 (9/115)

Irregular anti epileptic  
drug usage

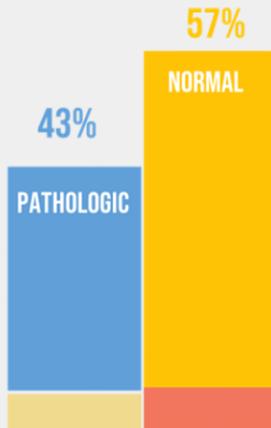


$p = 0.006$

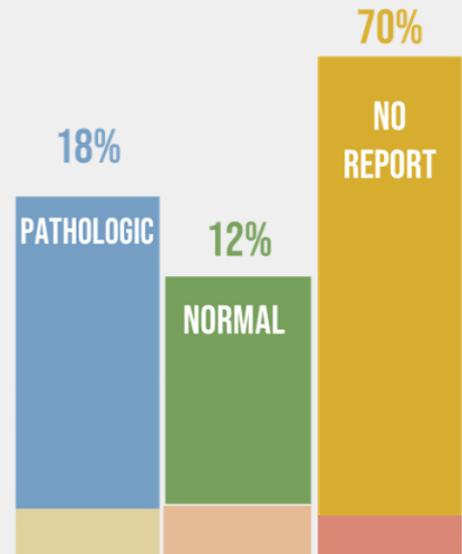
### Cranial MR/CT pathology



### Neurologic Examination



### EEG findings



## According to lab results



Anemia frequency → 59% (68/115)

Electrolyte disorders frequency → %34 (40/115)

Systemic infection frequency → 29% (34/115)

CNS infection frequency → 4% (5/115)

Leukocytosis frequency → 35% (41/115)

Elevated CRP → 47% (55 /115) (64% in first seizure  
27/47)

Covid-19 suspicion → 28% (33/115)

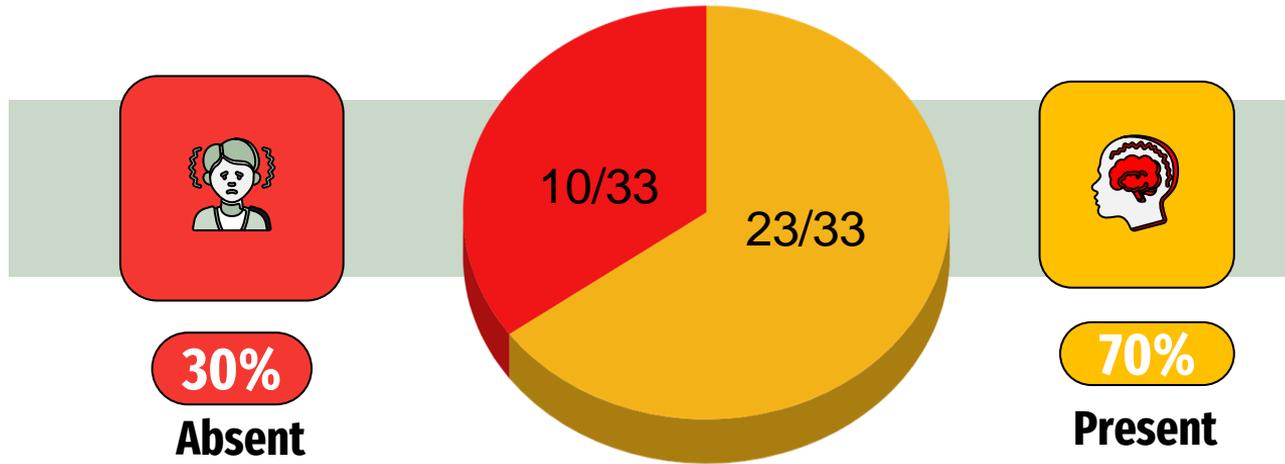
# Covid-19 & seizure ?

28.7% (33/115) of patients presenting with epileptic seizures had suspected Covid-19 (clinic and thorax CT).

Covid-19 and seizure type was examined, but no significant difference was found.

It was observed that the frequency of seizures increased in patients with epilepsy who came with the suspicion of covid.

# Epilepsy in patients with covid suspicion



- 4 patients had seizures while their Covid PCR was positive
- (2 first seizure).

# Covid-19 vaccination – epileptic seizure relation?

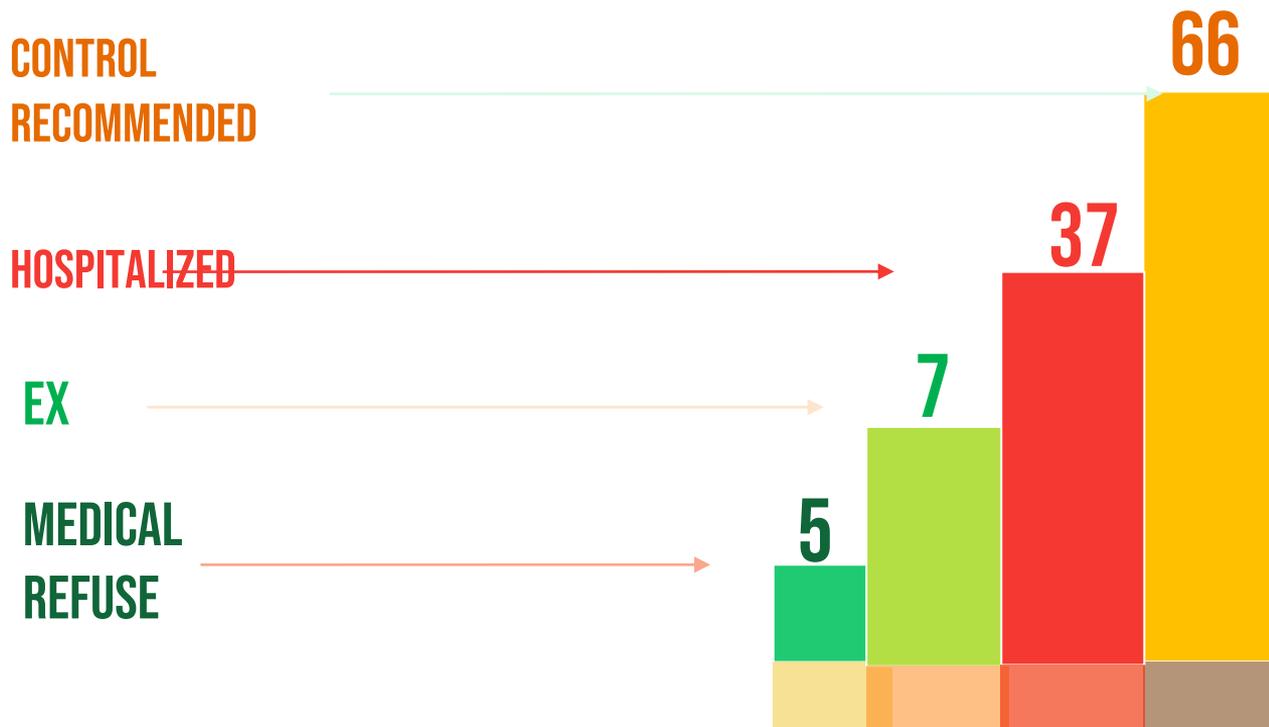


It was determined that 7 patients had seizures after the Covid Biontech vaccine within 48 hours.



While 5 of these patients were previously diagnosed with epilepsy, 2 had their first seizure.

# Follow-up



# Discussion & Conclusion

- Epileptic seizures are common disorders among patients in the emergency outpatient clinic.
- Our study showed that frequency of first seizures is significantly higher in the elderly patient population and there may be changes according to age groups in etiological studies.
- Acute symptomatic seizures are more likely to occur in older ages.
- In both groups, the most important triggering factor was infection.
- The frequency of genetic epilepsy was much higher in the younger age group, the second reason triggering seizures in this group was medication interruption

- The increase in the frequency of seizures in patients with suspected Covid-19 and the fact that covid-positive patients came with the first seizure clinic requires further research.
- In addition covid vaccines may be a triggering factor for the development of acute symptomatic seizures, this study should also be expanded in a specific patient population.
- In this regard current Covid -19 history and vaccination history should definitely come to mind and the investigation plan should be made quickly.

# Limitations

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Single center study

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Missing data

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Imbalance in the distribution by age groups

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The number of patients with covid.

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# Resources

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- 2) Emami , A., Fadakar , N., Akbari , A., Lotfi , M., Farazdaghi , M., Javanmardi , F., Rezaei , T. and Asadi-Pooya , A., 2020. Seizure in patients with COVID-19. *Neurological Sciences* , 41(11), pp.3057-3061.
- 3) Hernández-Ronquillo , L., Adams, S., Ballendine , S. and Téllez-Zenteno , J., 2018. Epilepsy in an elderly population : Classification , etiology and drugs resistance . *epilepsy Research* , 140, pp.90-94.
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- 6) Johnston , A. and Smith, P., 2010. Epilepsy in the elderly . *expert Review of Neurotherapeutics* , 10(12), pp.1899-1910.
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Thank you for  
listening

