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Initial Approach to the First Epileptic Seizure in the Emergency Department

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ABSTRACT

Keywords: First Seizure; Adults; Antiepileptic Drug; Treatment

Introduction

Seizure syndromes are a frequent consult in emergency services. It presents both patients and families a great shock hence great pressure to emergency service providers. Properly y identify seizure syndromes and making a timely intervention leads to a reduction do complications. The following article aims to describe the diagnostic process and management of the first seizure.

Epidemiology

Approximately 8% to 10% of the population will experience a seizure during their lifetime and of these 2 to 3% will develop epilepsy [1] , considering that about 150,000 adults consult emergency services each year with a first unprovoked seizure in the United States, this becomes one of the most common neurological problems [2]. The incidence of seizures is very variable, between 10 to 41 cases / 100.000 people every year [3]. It presents a bimodal distribution, being more common in patients younger than a year (4,3/100 000 patients/year) and patients older than 60 years (8,4/100 000 patients/year) [4,5]. It also presents male predominance with a ratio of 1.3:1 case over women [5]. Patients with multiple seizure episodes have a short-term mortality rate between 7.6 and 39% [6]. Main causes of mortality are age, acute etiology, and seizure duration [7]. In a study made in Sao Paulo in 2015 they found a mortality rate of 64.5% in patients older than 65 years in comparison to other adults and the pediatric population (34,7% y 25,7% respectively). No differences on mortality have been found adjusting by gender [7]. Short term mortality associated factors can be differentiated between complications and comorbidities [5]. Sepsis is the most common complication with a mortality rate as high as 28% due to infections such as healthcare associated pneumonia presenting in refractory states [5,7].

Clinical Consideration

A seizure was defined by the International League Against Epilepsy (ILAE) as the transient appearance of signs and/or symptoms due to abnormal, excessive or synchronous neuronal activity in the brain [1]. Other definitions should also be considered, such as an unprovoked seizure that occurs in the absence of precipitating factors and may be caused by a static or progressive lesion, an acute symptomatic seizure that is an acute manifestation occurring in close temporal association with a transient systemic or central nervous system disturbance, a focal seizure that originates within 1 part of a cerebral hemisphere, a generalized seizure where the initial activity is consistent with networks that are distributed in bilateral cerebral hemispheres, and the presence of epilepsy which is a brain disorder characterized by an enduring predisposition to generate seizures, defined by the presence of 2 or more unprovoked seizures occurring more than 24 hours apart or 1 unprovoked seizure and a high risk (at least 60%) of recurrent unprovoked seizures in the next 10 years [8].

It is very important at the semiology level to obtain an accurate description of the event in order to make a precise approximation and to make a differential of other possible causes that may simulate a seizure such as a migraine attack, a transient ischemic attack or syncope. It is at this point where the eyewitnesses of the event play a fundamental role, since they are a valuable source of information that should be questioned in a cautious manner in order to describe the events that occurred. A study in 2018 managed to prove that regardless of age or educational level, people who witness a seizure event have a high level of accuracy in describing it [9]. A first seizure event should initially be classified as provoked or unprovoked; provoked seizures may be due to acute or remote symptomatic factors, including metabolic disorders, acute infections, drug toxicity or structural brain lesions. Unprovoked are those in which no cause or trigger is found to explain the event and should be monitored as they may herald the onset of epilepsy or be accompanied by medical and psychiatric illnesses. A thorough work-up after a first seizure is necessary to establish the risk of recurrence and the need for antiepileptic treatment [10].

Initial Approach

Rational use of Resources

Before determining the diagnostic aids to use in a patient with a first epileptic status in the emergency department, one must make a thorough clinical history and examination to determine if there were any other factors starting the event such as seizures due to metabolic derangements, toxicity, head trauma o stroke among others [2]. It is relevant to confirm that it is the first episode of such characteristics, since 17% of patients consulting for a first generalized seizure event and 60% of other types of seizures, have experienced similar episodes that did not received medical attention o were misdiagnosed. In such cases, we have to consider a potential progressive central nervous system alteration known as "remote symptomatic seizures" that require an in-depth investigation about the etiology and neurological consult during they stay in the emergency department [11]. In the initial approach, the presence of focal neurological deficit must alert the medical provider to solicit neuroimaging, since it is usually associated with abnormal findings. However, 10% of all patients that debut with an unprovoked seizure might not have abnormal physical examination but positive findings in the imaging alone.

Now, the question is: Which is the best imaging to order? It will depend on the moment the patient receives medical attention; in the acute setting the aim is to discard lesion that require medical interventions, therefore, the best imaging to start is a Head CT scan without contrast media. Despite havening less sensitivity than MRI, its advantage is that it is faster to obtain and more widely available, it is also the preferred image in trauma associated seizures. MRI will be advantageous in patients with a negative CT scan but with persistence of the clinical suspicion of structural lesions as much as 26% of cases. It is related to prognosis and usually made 48 hours after de event by a neurology team, ideally in a 3-tesla equipment with an epilepsy protocol which is outside the scope of this article [11]. Related to the EEG, a retrospective study mad between 2014 and 2019 with 170 patients found that 35% registered epileptic discharges and the best diagnostic performance of this test is in the first 16 hours [12] (Figure 1).

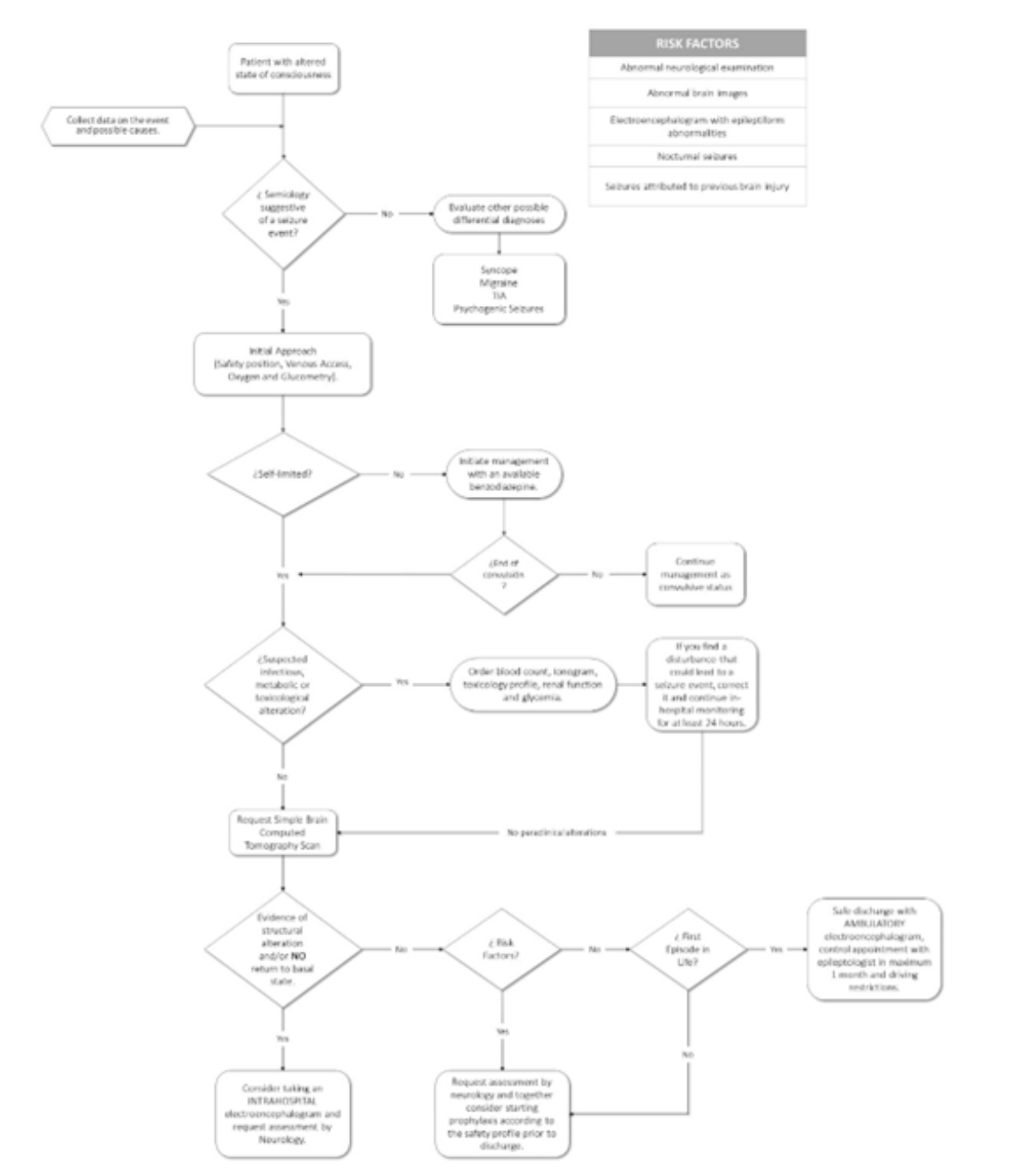

Figure 1.

Recurrence Risk

The short-term risk of presenting a new episode in the first month after debut will vary depending on the study, approximately 11.2%; it will raise to 15 – 18% 3 months after [13].

Treatment

Use of Benzodiazepines

Although benzodiazepines are the first-line management of seizures, its application in patients with a first seizure episode is

controversial. Many first episodes recede by themselves and the use of sedatives are relates to an increase short-term. Therefore, when considering this diagnosis, one must consider use con such medications in patients no resolving the seizure promptly such patients in epileptic status [13].

Prophylaxis

Most of seizure episodes presenting in adult age are going to be isolated, so the systematic use of anticonvulsant medications increases the risk of adverse events without an impact in long term remission, therefore de American academy of neurology does not recommend prophylaxis. It is recommended it beginning according to the risk of recurrence usually high during the first two years after the index event and increases with its association to remote seizures, previous brain lesion, abnormal EEG or imaging, or nocturnal debut. If detected at least one of these it will be relevant to start anticonvulsants [2,14,15]. If the patient has none of those indications to start anticonvulsant or urgent consult with neurology can be discharge and follow up as outpatient ideally during the first month. Here they reassess patients including risk factors and confirm the diagnosis since 27% con seizures are misdiagnosed in the emergency department [13].

Conclusion

Although first epileptic seizures and its attention are hard to diagnose, a careful clinical evaluation, rational use of resources and judicious selection for patients to start medications is important to decrease short-term risk regarding mortality and adverse events related to medication.

References

1. Wirrell E (2022) Evaluation of First Seizure and Newly Diagnosed Epilepsy. Continuum (Minneap Minn) 28(2): 230-260.
2. Krumholz A, Wiebe S, Gronseth GS, Gloss DS, Sanchez AM, et al. (2015) Evidence-Based Guideline: Management of an Unprovoked First Seizure in Adults: Report of the Guideline Development Subcommittee of the American Academy of Neurology and the American Epilepsy Society. Epilepsy Curr 84(16):1705-1713.
3. De la Cruz WF, Zapata WR, Delgado JC, Mija L (2014) Estado epiléptico convulsivo en adultos atendidos en el Instituto Nacional de Ciencias Neurológicas de Lima, Perú 2011-2013. Rev Neuropsiquiatr 77(4): 236-241.
4. Leitinger M, Trinka E, Giovannini G, Zimmermann G, Florea C, et al. (2019) Epidemiology of status epilepticus in adults: A population-based study on incidence, causes, and outcomes. Epilepsia 60(1): 53-62.
5. Castellanos RG, Barrios Peralta E, Suarez J, Nariño D(2017) Enfoque del estatus epiléptico en adultos: consideraciones sobre la fisiopatología y tratamiento. Acta Neurológica Colomb 33(3): 199-210.
6. Sirikarn P, Pattanittum P, Sawanyawisuth K, Tiamkao S (2019) Causes of death in patients with status epilepticus. Epilepsy Behav 1: 101.
7. Stelzer FG, Bustamante G De O, Sander H, Sakamoto AC, Fernandes RMF (2015) Short-term mortality and prognostic factors related to status epilepticus. Arq Neuropsiquiatr 73(8): 670-675.
8. Gavvala JR, Schuele SU (2016) New-onset seizure in adults and adolescents: A review. Vol. 316, JAMA - Journal of the American Medical Association. American Medical Association16(24): 2657-268.
9. Muayqil TA, Alanazy MH, Almalak HM, Alsalman HK, Abdulfattah FW, et al. (2018) Accuracy of seizure semiology obtained from first-time seizure witnesses. BMC Neurol 18(1): 135.
10. Foster E, Carney P, Liew D, Ademi Z, O Brien T, et al. (2019) First seizure presentations in adults: Beyond assessment and treatment. Vol. 90, Journal of Neurology, Neurosurgery and Psychiatry. BMJ Publishing Group 90(9): 1039-1045.
11. Tranvinh E, Lanzman B, Provenzale J, Wintermark M (2019) Imaging evaluation of the adult presenting with new-onset seizure. Vol. 212, American Journal of Roentgenology. American Roentgen Ray Society 212(2): 15-25.
12. Llauradó A, Santamarina E, Fonseca E, Olivé M, Requena M, et al. (2020) How soon should urgent EEG be performed following a first epileptic seizure? Epilepsy Behav 1: 111.
13. Alesefir W, Maillard L, Klemina I, Vignal JP, Tyvaert L (2020) Short-term risk of relapse after a first unprovoked seizure in an adult population. Neurophysiol Clin 50(2): 87-92.
14. Leone MA, Giussani G, Nevitt SJ, Marson AG, Beghi E (2021) Immediate antiepileptic drug treatment, versus placebo, deferred, or no treatment for first unprovoked seizure. Cochrane Database of Systematic Reviews 2016: 5.
15. Bergey GK (2021) Management of a First Seizure. Contin Lifelong Learn Neurol 22(1): 38-50.

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