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Transient Epileptic Amnesia: A Mystery of Human Memory, Are There Lessons to be Learned?

Nishant Tripathi[1,*], Niki Koirala[2]

[1]Hospitalist, Ottumwa Regional Health Center, Ottumwa, Iowa
[2]PGY1 Pharmacy Resident, Covenant Medical Center, Waterloo, Iowa
*Corresponding author: nishant55@icloud.com

Abstract Transient epileptic amnesia (TEA) may be suspected in patients meeting all of the following criteria: 1) History of recurrent witnessed episodes of transient amnesia; 2) Cognitive functions, excluding memory, judged to be intact during typical episodes by a reliable witness; 3) Documented epilepsy. However, patients who lack a documented diagnosis of epilepsy, may meet the two previous criteria. Such rare and atypical cases, as the one described below, require high clinical suspicion for epilepsy, as well as TEA. Here we describe a rather intriguing case of TEA.

Keywords: *TEA, amnestic attacks, transient epileptic amnesia, epilepsy, post-ictal amnesia*

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1. Case Summary

XY is a 61 year-old caucasian male brought to emergency room with chief complaint of confusion. Patient has a PMH of diet controlled DM2 and generalized tonic-clonic seizure x 20 years on multiple anti-epileptics namely phenytoin, phenobarbital and topiramate. Patient is a diligent and punctual employee of an auto-repair shop; however, he failed to report to work without any notice. XY's employer unsuccessfully attempted to contact him via phone; then, visited patient's residence. When the door remained unanswered, out of concern, he forced into the house and found XY located in front of the TV in no apparent distress but lacked awareness of his schedule and appeared confused. In ER, patient maintained ability to recall his name, address, and current events but was unable to answer any questions addressing date and time (including date of birth), or the reason behind seeking medical attention. He did not appear bothered by this at all and kept on asking where was he and why was he in the hospital. He showed no physical evidence of possible stroke and all other neurologic exams were negative. Head CT was negative, so were all lab findings except subtherapeutic serum phenytoin level. Due to the uncertainty in diagnosis, postictal symptoms versus acute neurologic disorder, he was admitted for observation. Despite repeated reorientation attempts for the following 2 days and essentially normal neurologic exams, patient remained confused in regards to date and time. Neurology consult recommended no further workup. The patient finally returned to baseline on day 3. Upon subsequent evaluation, he reported being currently followed by a neurologist due to similar previous occurrences of one to two seizures with TEA annually. The patient was discharged home with follow up with neurology scheduled.

2. Discussion

TEA is a clinical syndrome present in the temporal lobe epilepsies [5]. It is characterized by the presence of all of the following [1]:

1) History of recurrent witnessed episodes of transient amnesia

2) Cognitive functions, excluding memory, judged to be intact during typical episodes by a reliable witness

3) Documented epilepsy.

TEA are characterized by pure amnestic attacks in one-third of the cases. Rest two-third of the cases have other manifestations of epilepsy including auditory and visual hallucinations [7].

Postictal confusion is a hallmark of seizure disorder; nevertheless postictal amnesia limited to temporal factors stimulates curiosity. Previous articles generally depict cases of transient global amnesia lasting minutes to hours; this patient case is unique as it reports rare and underrecognized time-specific amnesia spanning three day period.

TEA usually affects elderly, and thus can easily be misdiagnosed as dementia [2]. It affects male sex predominantly [7]. TEA episodes are usually brief (lasting for less than an hour), and recurrent (mean frequency of 3 episodes each year) as per the findings of the TIME project (the impairment of memory in epilepsy) [3]. Repeated questioning can occur during the episode of TEA, and such attacks often occur on waking. Video EEG monitoring during sleep revealed epileptiform activities in 83% of cases and is an important diagnostic tool [6].

No clear pathophysiologic or anatomical explanation for TEA exists, however hippocampal-mesial temporal

lobe dysfunction with possible thalamus or brainstem nuclei involvement may justify the associated amnesic symptoms with maintained consciousness [3]. While few cases of postictal amnesia are reported, they are identified under various terminologies- pure amnestic seizures, ictal amnesia, epileptic amnesic attacks and epileptic transient amnesia. TEA is commonly observed in temporal lobe epilepsy or subclinical status epilepticus. As patient XY remained alert and awake with majority of his memory intact, status epilepticus was an improbable diagnosis. Patient had a known history of epilepsy, and he had multiple EEGs (electroencephalograms) done in the past documenting the presence of epilepsy. CT head and MRI brain done in the past were unremarkable.

As symptoms are subtle and transient, patients may be undiagnosed and untreated for several years. Untreated seizures can be fatal, thus, early diagnosis is very important. TEA can also be misdiagnosed as transient global amnesia (TGA), transient ischemic attack, psychogenic amnesia or dementia, making accurate diagnosis even more important [5]. Regardless, the underlying epileptic etiology of TEA appears to respond favorably to antiepileptic therapy, with full treatment response seen in 73 to 96% of cases [6]. Thus, once diagnosed, further work up at each hospitalizations may be unnecessary- which is financially favorable.

Prognosis of TEA remains unclear, however, persistent memory disturbances, loss of autobiographical memory and accelerated long-term forgetting was common [4,5]. There is frequent occurrence of depression and autoimmune disorders in patients with TEA [4].

This case provides a rare in vivo opportunity to obtain a deeper understanding of human memory, including allocation of memory specific control of each portion of the brain. Few additional inquires may be answered with further research: does TEA correspond to ictal or postictal state; is it a prognostic factor; is it associated with early dementia; are additional therapies beyond antiepileptics indicated?. The goal of this article is to increase awareness of primary care physicians, hospitalists and neurologists regarding TEA and its treatment.

3. Conclusion

Although TEA is rare, it requires high level of suspicion for epilepsy as it may be a presenting symptom. It may provide advanced understanding of human memory and allocation of brain functions. Excellent response to antiepileptic treatment and great prognosis make accurate diagnosis essential. Appropriate diagnosis may also alleviate complications and costs associated with extensive neurologic work up.

Statement of Competing Interests

The authors declare no conflict of interest in preparing this article.

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