



Case Report

Acute postictal confusion and violence: Two cases with unfortunate outcomes[☆]Arthur C. Grant^{a,b,*}, Ewa Koziorynska^a, Catherine Lushbough^a, Douglas Maus^{a,b}, Katherine Mortati^a^a Department of Neurology, SUNY Downstate Medical Center, 450 Clarkson Avenue, Brooklyn, NY 11203, USA^b Department of Physiology & Pharmacology, SUNY Downstate Medical Center, 450 Clarkson Avenue, Brooklyn, NY 11203, USA

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ABSTRACT

Patients with temporal lobe epilepsy (TLE) often have a brief postictal state characterized by confusion and disorientation. Less common postictal behaviors include wandering and violence – both reactive and spontaneous. We describe two male patients with left TLE and unusual postictal states that led to unfortunate outcomes. The first patient's postictal state included an intense urge to peregrinate, as well as reactive violence. When a frightened houseguest prevented the patient from exiting his bedroom during a postictal state, the patient climbed out the window and fell to his death. The second patient's postictal state included menacing posturing, loud exclamation of guttural sounds or profanities, clapping or smacking his hands together, and punching nearby objects. During a postictal state at home, he grabbed a bat and destroyed furnishings. After he had two seizures at work followed by his typical postictal state, he was dismissed because of his perceived threat to coworkers.

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1. Introduction

In temporal lobe epilepsy (TLE), the postictal state is typically characterized by confusion and disorientation. Perhaps as a result of these feelings, patients are also often fearful and agitated and may forcefully resist being restrained [1,2]. As opposed to such reactive violence, spontaneous postictal violence is rare, though well described [2–5]. It usually takes the form of a nonspecific but potentially destructive assault on the patient's surroundings, particularly if the patient has access to an object (e.g., a bat or a knife) to use as a weapon. In these instances, it is as if the postictal state has disinhibited a primitive rage reflex, which becomes reinhibited as the postictal state dissipates.

We describe two patients with left TLE and unusual though stereotypical postictal states, both of which included violence and led to unfortunate outcomes. These cases also illustrate the potential for witnesses, including epilepsy monitoring unit (EMU) nurses, to influence the elaboration of aggressive behavior. The first patient was admitted to our EMU before the nurses had received formal training in how to manage postictal confusion, agitation, and aggression, while the second patient was admitted after this training had been provided.

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2. Case 1

A 26-year-old man had a 1.5-year history of complex partial seizures with secondary generalization. Most of his seizures occurred during sleep or within a few hours of awakening. At the time of his initial evaluation at our center, he was treated with phenytoin and levetiracetam polytherapy, which was ultimately changed to carbamazepine monotherapy. Seizure semiology was described by family members as left- or right-hand automatisms and unresponsiveness, progressing to forced head deviation to the right and a convulsion. There was often associated tongue biting and urinary incontinence.

His postictal state was characterized by mute confusion, agitation, and interestingly, a strong urge to peregrinate. If unimpeded, he would always leave the room or even the building, and then walk aimlessly until the conclusion of the postictal period. He had been arrested by police several times while walking outdoors in his underwear in the middle of the night. Attempts to restrain him, for instance by police officers applying handcuffs to his arms held behind his back, were reliably met with resistance and combativeness, but he was never spontaneously aggressive.

Neurological examination was unremarkable. The only known epilepsy risk factor was a possible closed head injury at age 4, when he fell to the ground from a second-story window. He was admitted to a hospital for observation and discharged the next day without concussive symptoms. A brain MRI scan was reportedly normal but was not available for independent review. Interictal EEG was notable for independent, left more frequent than right, anterior temporal epileptiform discharges and bitemporal slowing.

Five electrographic seizures and one electroclinical seizure, all of left temporal onset, were recorded during two days of diagnostic

video-EEG monitoring. The clinical seizure began in stage 2 non-REM sleep and consisted of behavioral arousal followed by manual automatisms → head version to the right → ictal cry → secondary generalization. The electrographic onset was characterized by sharply contoured, rhythmic, 6-Hz theta activity over the left anterior temporal region (phase reversing at electrode F7) which then evolved in frequency, amplitude, and distribution.

The convulsion followed by his typical postictal state is shown in Video 1. He tries to climb over the bed guardrails but is restrained by a nurse. He then stands up on the bed, and while trying to pull him down, the nurse panics and starts screaming for help. Several staff members enter the room, subdue the patient, and force him into a prone position.

The patient's family had learned to permit his postictal perambulations, since restraining him would only provoke agitation and physical resistance. Unfortunately, he had a seizure in his bedroom in the presence of only a houseguest unfamiliar with his epilepsy. Seeing the patient become very confused and disoriented after the seizure, the guest prevented him from leaving the room by holding the door closed from the outside. The patient left the room through the only available egress – an open window – and tragically fell 4 stories to his death.

3. Case 2

A 35-year-old man had a 7-year history of seizures with no definitive epilepsy risk factor. Medical history was significant for well-controlled systemic lupus erythematosus and deep venous thrombosis. His seizures began as nocturnal convulsions during sleep, occurring up to three times per month. Treatment with phenytoin and levetiracetam controlled the seizures for about four years, when a new nocturnal behavior emerged. According to family members, he would awaken during the night with his eyes wide open and have a “wild-looking” appearance. He would get out of bed, walk around the house, shout epithets or unintelligible sounds, and forcefully slap his hands together. Occasionally, he would be violent by, for instance, grabbing a baseball bat and striking walls and furniture, causing substantial property damage. He was unresponsive to verbal stimuli throughout these events, which would last for 5 to 10 min and were followed by complete postictal amnesia. Zonisamide was added to his medication regimen.

His interictal personality was calm and self-effacing, and he was embarrassed when told of his behaviors during the episodes. He was employed as an office clerical worker, and, unfortunately, two seizures followed by his typical postictal state occurred at his workplace. Coworkers feared he posed a risk to their safety. He was put on medical leave and subsequently dismissed based on a medical evaluation that he was “not fit to return to duty.”

Physical examination and brain MRI were unremarkable. An interictal brain FDG-PET scan demonstrated mild hypometabolism of the left temporal lobe. Interictal EEG demonstrated left temporal intermittent rhythmic delta activity (TIRDA), which has the same significance as temporal spike-wave discharges [6].

Five stereotypical seizures were recorded during diagnostic video-EEG monitoring, two with onset in sleep and three in wakefulness. Those that arose during sleep were characterized clinically only by rhythmic eye blinking at about 1 Hz. Seizures during wakefulness also included lip smacking, altered responsiveness, right hand automatisms, and late body rotation.

Electrographically, the seizures began with sharply contoured, rhythmic 4-Hz activity in the anterior left temporal region, maximal at electrodes T1 and F9. This activity evolved in frequency, amplitude, and distribution to include the left parasagittal and then the right temporal electrode chains, and continued for a total of 75 to 150 s. The postictal EEG was characterized by diffuse attenuation, with frequent obscuration by movement and muscle artifacts.

All five seizures were followed by a characteristic and dramatic postictal state lasting 5–10 min (Video 2). It consisted of agitation, pacing, menacing posturing, loud exclamation of profanities or unintelligible sounds, forcefully slapping his hands together, and smacking one fist into the opposite palm. In one instance, these behaviors were complemented by punching the wall in the hospital corridor with his bare fists. The EMU nursing staff made no attempt to restrain the patient, allowed his behavior to normalize, and then helped him back into bed. Unrestrained, the patient did not try to harm himself or the nursing staff. The patient had complete amnesia for both his seizures and postictal behaviors.

4. Discussion

The acute postictal state is an extraordinary and poorly understood phenomenon. It is more common in TLE than in other epilepsy syndromes, even those in which the seizure itself involves much more cerebral cortex, e.g., absence epilepsies. In patients with TLE, it can develop after complex partial seizures with or without secondary generalization, suggesting that the temporal lobe seizure itself is a crucial requirement. Biomarkers for postictal brain dysfunction include focal and diffuse EEG slowing [7] and focal hypometabolism [8]. However, existing biomarkers do not account for the remarkable diversity of postictal behaviors.

In addition to profound confusion, the first patient had an ineluctable urge to be unconfined and to walk. In this regard, he is reminiscent of a famous case described by Charcot [9] and similar to other cases of postictal wandering, which is more common in TLE than in extratemporal epilepsy [10]. The combination of unresponsiveness and bizarre behavior, e.g., walking the streets in his underclothes or standing up in his hospital bed, sufficed to alarm and frighten witnesses, including an inexperienced EMU nurse. In the EMU, several staff members were required to restrain the patient, including security officers. One can easily imagine that, in a public setting, bystanders might alert the police, triggering an inevitable escalation to arrest and an emergency department evaluation.

The patient's family members were faced with a particularly difficult dilemma as he entered his postictal state. If they tried to prevent him from leaving his apartment, there was considerable risk of provoking a violent reaction resulting in injured people and damaged property. If they allowed him to leave, there was the risk that he could be the victim of an assault or be subject to police arrest and the ensuing legal responsibilities. The very real nature of the patient's abnormal thought processes and drive to escape confinement during his postictal state was demonstrated by the circumstances of his tragic death – escaping his fourth floor bedroom through the open window.

The second patient's postictal state, unresponsiveness combined with posturing, swearing, and fisting and slapping his hands, would inevitably be perceived as threatening to those unfamiliar with his clinical condition. Even worse, the patient was often destructive – punching walls and smashing nearby objects – behaviors which would certainly magnify his perceived dangerousness. However, when not approached or restrained by other people, his violence was nonspecific and directed at any nearby object, as has been described in other patients with TLE [1–3]. In fact, punching walls with his bare fists was much more likely to be self-injurious than damaging to the wall, further evidence that these behaviors were unintentional and resulted from abnormal thought processes. Yankovsky et al. described a patient with a symptomatic generalized epilepsy who fractured his tibia and fibula during an episode of postictal rage and aggression [11].

The reaction of the EMU nurses to this patient's postictal state was entirely appropriate. They remained calm and watchful and did not interfere with his behaviors or try to restrain him. He appeared unaware of their presence through the evolution of his postictal

behaviors and, ultimately, did not resist being directed back into his room and hospital bed.

The best, if not always possible, treatment of postictal violence is prevention with perfect seizure control. When seizures cannot be completely controlled, there is a logical tripartite treatment approach. First, family, close friends, and, if possible, coworkers should be aware of the patient's seizure semiology, postictal behaviors, and risk of postictal violence. They should know how to react during the postictal state so as to minimize risk of harm to themselves and the patient. Second, the home and workplace should be free of weapons, e.g., firearms, and readily available objects that could easily be used as weapons, e.g., baseball bats or fireplace pokers. Third, acute treatment during or immediately after the seizure with a benzodiazepine should be considered to prevent or diminish the severity and duration of a violent postictal state. Ideally, if allowed by the patient, family and, perhaps, close friends should be trained to administer an appropriate parenteral formulation such as oral disintegrating tablets, a nasal spray, or an intramuscular injection. Since the efficacy of benzodiazepines to prevent elaboration of a violent postictal state has not been empirically demonstrated, their use should be tailored to each patient's clinical circumstances.

5. Conclusion

One can speculate that the typical postictal state of confusion and disorientation is the behavioral result of incomplete recovery of both self-identity and short- and long-term memories. Less common postictal behaviors, such as those of the two patients described here, may represent primitive human behavior patterns released or disinhibited by postictal suppression of normal executive functions. The first patient demonstrated a profound drive for "flight" – to

escape confinement – while the second patient appeared to demonstrate primitive "fight" reflexes including both verbal and motor components. Taken together, these two cases illustrate that the postictal state can pose a much greater risk of harm to the patients themselves than to those around them.

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.ebcr.2013.04.001>.

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