

Epileptic Psychosis and Insanity: Case Study and Review

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This brief clinical report focuses on a case in which we were ordered by the Wayne County Circuit Court to complete a forensic evaluation of a 26-year-old man facing criminal charges of Felonious Assault and Criminal Sexual Conduct. The patient believed that he had committed the offenses but that his behavior was substantially influenced by a recently diagnosed seizure disorder. After a complete clinical exam, the forensic examiners (Patrick Bacon, MD and Elissa Benedek, MD) reported to the court the defendant was psychotic at the time of the alleged offense and this psychosis was associated with his epileptic disorder but did not represent an epileptic automatism.

In the past century, many epileptics charged with a crime have defended themselves by arguing that their alleged criminal behavior was the result of an epileptic automatism. Investigators have delineated research criteria to evaluate the question of whether the behavior of these individuals could have been the result of an automatism.^{1,2,3} To our knowledge, no epileptic has argued he or she was legally insane at the time of the alleged offense *and* his or her insanity was due to a psychotic episode that occurred as a concomitant of his or her epileptic disorder. Psychotic episodes that occur in association with various epileptic disorders have been reported by several investigators.^{4,5} The characteristics of these psychotic episodes are significantly different from the characteristics of epileptic automatisms. We review the patient we evaluated and discuss the characteristics of automatisms and epileptic psychoses that allow each to be recognized as a distinct clinical entity.

Case

Bob is a 26-year-old, right-handed, divorced, white male. He is the product of a normal pregnancy and delivery. His developmental milestones were reached at the appropriate times in childhood. He was described by his parents as having been a quiet and obedient child and a "slow learner" in school. He had few friends in grade school but was more outgoing in high school and developed many friendships, most exclusively with girls. He graduated high school with a "B" average and went on to complete four years of college. For the past four years he has worked in a halfway house for runaway adolescents. A marriage at 22 for one and one-half years produced no children. He has no history of violent behavior or arrests and obtained conscientious objector status during the Vietnam War.

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His medical history is remarkable for a severe episode of chicken pox at age two requiring hospitalization for several days. He had an extremely high fever, but there is no record of febrile convulsions. After his divorce, he began to suffer what his parents describe as "physical spells." During these episodes, he became pale and "pasty-looking," complained of feeling faint, and appeared emotionally shaken. The episodes lasted a few minutes and would be followed by up to eight hours of lethargy and sleep. He was evaluated several times by a general physician but no physiological cause was discovered. The spells decreased in frequency but persisted until the onset of his more generalized seizures. About eight months before his seizures began, he was assaulted and suffered some head trauma. He used alcohol infrequently and had only used controlled substances on two occasions during adolescence.

He had no history of psychiatric hospitalizations prior to the alleged offense. However, he was mildly depressed after his divorce and sought outpatient counseling with a social worker for one and one-half years. He began psychotherapy again after the onset of generalized seizures.

Six months prior to the alleged crime, Bob began to experience major motor (grand mal) seizures. In the post-ictal period, he was very confused, lethargic, and disoriented. The post-ictal confusion lasted from one to four days and was sometimes accompanied by feelings of depersonalization and visual disturbances such as micropsia, macropsia, and objects appearing two-dimensional. Numerous EEGs revealed no focus of seizure activity, and a neurologist maintained him on Dilantin, 300 mg., daily.

Bob's seizures gradually increased in frequency, and he suffered major distress that he focused on the long confusional periods. His parents and friends noted a change in his personality and behavior. They described unusual affective states, decreased attentiveness, alternating lethargic and excitable periods, and him as having a "strung-out" quality. He was fired from his job and sought more counseling for the third time at this point.

Three days prior to the alleged offense he had a severe, witnessed, documented seizure. On the day prior to the alleged offense, he began acting strangely and told his parents that he could see the devil in their neighbors. Later that day, his behavior was described by his parents as strange in that he stood in one place for 10-20 minutes at a time, was unresponsive to verbal stimuli, and showed peculiar positioning of his arms. On the day of the offense, he appeared to his parents as neither confused nor lethargic. He reported to them that his thinking was clear. His parents also reported he displayed rapidly bizarre fluctuating emotions. He related much peculiar material to his parents and friend, which centered on his thoughts of evil and the devil. Although he was able to carry on a conversation, read a magazine, and play basketball with his brothers, he continued to manifest peculiar euphoric affect and to relate unusual religious and mystical ideas to his relatives. Late in the day, he suddenly described feeling very anxious and ran out of his parents' house. Several blocks away, he encountered a

middle-aged woman walking her dog. He politely offered to walk the dog. When she refused the offer, he physically attacked her, tearing off much of her clothing. A nearby jogger heard her screams and pulled Bob away, restraining him. Bob did not resist but insisted he had done to "Satan" what "God" had wanted him to do.

The following day Bob was no longer behaving in a peculiar fashion. He recalled, though not clearly, what he had done the previous day, and he felt very remorseful, ashamed, and shocked that he had behaved in an assaultive manner. He no longer had unusual thoughts of the devil or religion and seemed to the clinical examiner to speak in a clear, coherent fashion with no delusional ideation. During a subsequent diagnostic psychiatric hospitalization he experienced several more grand mal seizures and brief psychotic episodes associated with them. The delusional ideation was similar. An epileptic focus was found in the right temporal lobe, and he was placed on carbamazepine. His seizure frequency greatly diminished, and he has had two psychotic episodes associated with seizures since starting on the new medication.

Discussion

Epileptic automatisms are episodes of behavior that are not under the conscious volitional control of the epileptic.⁶ During the automatism, there is a decrease in cognitive ability, usually with a decreased level of consciousness, confusion, or clouding of consciousness.⁷⁻¹¹ If slight, the decrease in cognitive functioning can be overlooked by the casual observer.^{4,12} However, the decrease in cognition can easily be demonstrated by having the patient attempt such tasks as solving mathematical problems, or reading and summarizing a few paragraphs of written material.^{8,12} Typically, the behaviors observed during the automatism are simple, stereotyped, repetitive motor activities that recur with each seizure.^{8,9,10} Virtually any motor activity is possible, but complex goal directed activities — athletics, detailed household chores, or vocational activities — are not seen.^{8,9,12} Violence, including violence directed toward a specific person or object, is possible.^{2,10} During a violent automatism, the epileptic does not search out specific objects to attack, but rather acts aggressively toward anything in his or her path.^{2,10} During the automatism, the epileptic may express a variety of feelings with fear, anxiety, and agitation being most frequently reported.^{9,12,13} The epileptic also may be delusional or hallucinate during the automatism.¹³ Finally, epileptics are typically amnesic for their seizures — particularly for the automatic behaviors that occur during the seizure. The epileptic is usually also amnesic for much of a post-ictal twilight state, especially the early moments, but may retain partial, usually confused memories of the post-ictal event.^{9,10,11}

Automatisms occur immediately prior to, after, or during a seizure, and are associated with EEG abnormalities. Automatisms have been described in three time intervals with respect to various seizure patterns: (1) during the ictal phase of a single partial complex seizure, (2) during the ictal or inter-

Table.

| | Automatism | Psychosis |
|---|--|--|
| Level of consciousness | usually decreased | usually normal |
| Complexity of motor behavior | simple, non-goal directed | complex, goal-directed |
| Violence | possible | possible |
| Hallucinations, delusions | yes | yes |
| Amnesia for event | frequently | occasionally |
| Duration of event | minutes to day | hours to years |
| Temporal relationship to ictus | with ictus or within 12 hours | immediately prior to or after ictus, or separated by days-weeks from ictus |
| EEG concomitant | ictal activity of background abnormalities | baseline or improved |
| Type of seizure | grand mal, petit mal temporal lobe | grand mal, petit mal, temporal lobe, focal |
| Relationship to severity, frequency, duration of seizures | none | none |

ictal phases of petit mal status epilepticus, and partial complex status epilepticus (these disorders typically involve a single, prolonged ictus, or a series of ictal events occurring at short time intervals with no complete return to consciousness during the inter-ictal period),^{8,14,15} and (3) during a post-ictal twilight state immediately following a partial complex or grand mal seizure.^{5,7,11,14,16} When the automatism occurs during the ictal event, the EEG exhibits spike and wave activity consistent with the type of seizure.^{9,10,12,14} The EEG during an inter-ictal automatism may show roughly normal activity or abnormalities in the background wave pattern — diffuse dysrhythmias with periods of high voltage slow waves and theta and delta rhythms.^{10,11,12,14,15} In post-ictal twilight states, the EEG frequently shows initial low voltage slow waves and theta and delta rhythms. As the patient regains normal consciousness, the EEG improves, returning to a normal pattern with a predominance of alpha activity (or the patient's baseline activity) at the resolution of the twilight state.^{10,11}

Automatisms are usually of short duration. They may be as short as a single complex partial seizure (usually less than five minutes).⁹ However, petit mal status and partial complex status epilepticus may last from hours to days in duration.^{8,12,14,16} Post-ictal twilight states are from minutes to hours in duration — nearly all last less than 12 hours.^{1,7,10,11} Automatisms associated with seizure disorders last less than 12 hours.

In contrast, psychotic episodes occurring in association with epilepsy have been divided into two main clinical categories: (1) brief, self-limiting psychotic episodes — from days to weeks — and (2) prolonged episodes — from months to years — which may become chronic disabling illnesses.^{4,5,17} The epileptic patient may experience any type of psychiatric symptom during either length of psychotic episode, though certain symptoms are described predominantly in one type or the other. The most frequently

reported symptoms in both brief and prolonged are delusions of a paranoid, persecutory, mystical, or religious nature.^{17,18,19,20} Severe hypochondriacal delusions of grandeur also have been described but with less frequency.⁴ Well-organized delusional systems are rarely seen.²⁰ Auditory hallucinations are also frequently described. Visual hallucinations and illusions are more frequent in this population than in general populations of schizophrenics.^{5,17,21} Slater reports that 60 percent of his 69 patients displayed catatonic symptoms at some time.¹⁸ Epileptics with prolonged psychoses tend to show relatively normal affect — not the flat, bizarre, or inappropriate affect often seen in chronic schizophrenics. Conversely, epileptics with brief psychoses are more likely to have both mood and affect disturbances with depressive symptoms being more common than manic or hypomania.^{4,17,20,22} Brief epileptic psychoses most typically occur with a *clear or normal* level of consciousness, though brief periods of confusion may occur during a prolonged psychotic episode.^{4,5,18,22} During the psychosis, the epileptic may be capable of complex goal-directed motor activity and normal cognitive functions. In this respect, they can be considered very similar to the general populations of schizophrenics and differentiated from epileptic automatism. The epileptic who has suffered a psychotic episode typically has clear memories of some of the events during the episode and may have total recall.^{5,18}

The relationships between the onset and type of psychosis, and type, duration, severity, and frequency of seizure activity has been described in several studies. Psychotic episodes have been described in association with generalized seizures, focal seizures, and temporal lobe seizures.^{4,21} The prolonged psychoses tend to occur in association with temporal lobe seizures.^{5,17,18,22} The duration of the seizure disorder is unrelated to the occurrence of brief psychotic episodes. Indeed, psychotic episodes may occur after the first seizure.⁴ However, epileptics with prolonged psychoses typically have onset of the psychosis 10 to 20 years after the onset of the seizure disorder.^{4,17,22} In Slater's series of 69 epileptics with prolonged psychoses, the mean interval between onset of seizures and onset of psychosis was 14 years. In this study, there were two patients with onset of psychosis less than one year after the onset of the seizure disorder.¹⁸ The severity of the seizure disorder shows no relationship to the susceptibility for, or probability of, developing psychotic episodes. The seizure frequency also shows no relationship to the probability of developing psychotic episodes.^{4,17,18}

In contrast to automatism, epileptic psychotic episodes are typically not temporally related to ictal periods. The brief psychotic episodes may occur just prior to or immediately after a seizure, or may be separated from any ictal activity by days or weeks. Further, EEG abnormalities are unusual during the psychotic episode. Typically, the background pattern does not change from the patient's normal or baseline activity during the psychotic episode.²¹ Paroxysmal bursts of spike wave formations in the area of the epileptic focus may be reinforced or increased during the psychotic episode, but more frequently the EEG pattern improves, with complete disappear-

ance of focal paroxysmal activity.^{10,17,18,21} The phenomenon was noted several years ago by Landolt, who coined the term "forced normalization" to describe the improvement in the EEG he believed was characteristic of the brief epileptic psychosis.¹⁰ These relationships between ictal activity and psychosis have been noted in the epileptic patients with prolonged psychosis, although to a lesser extent. In this population, the seizures often decrease in frequency and may stop entirely for months or years, but the EEG usually retains focal paroxysmal activity.^{4,5,18}

The mechanisms that may be involved in the association between psychosis and epilepsy have been extensively reviewed by investigation.^{4,5,17,18} Slater and Beard have demonstrated statistically that a purely chance association between these two relatively infrequent disorders cannot explain the great number of patients with both illnesses reported.¹⁸ Slater's study along with several others have supplied evidence to reject the hypothesis that these epileptic patients had a genetic predisposition or vulnerability to developing schizophrenia or psychosis.^{4,17,18} Two other hypotheses have been seriously considered: (1) the psychological effects and social strain of the seizure disorder, especially the phenomena of complex partial seizures, eventually disrupts the personality to the extent that a psychotic personality results, or (2) a lesion occurs in the limbic system that can manifest as a psychosis and/or a seizure disorder.^{17,23} The first of these hypotheses is not readily accepted as a sole explanation. If this hypothesis were true, it would be expected that increased seizure frequency, severity, and duration would cause more disruption of psychic life and would be very positively correlated temporally with psychosis. However, as we have mentioned, the seizure frequency, severity, and duration are not positively correlated with psychosis. The second of these hypotheses is more difficult to evaluate, largely because of the practical difficulties of demonstrating a brain lesion as a causative factor of psychotic episodes. Investigators have suggested several possible types of lesions might cause both epilepsy and psychosis, but no lesion of this type has been demonstrated either grossly or microscopically.^{4,5,17,18,22} Thus, the question remains unanswered, with most investigators suspecting a physiologic lesion in the brain is the primary causative factor, and that the psychological and social issues are secondary factors that vary from case to case in significance.^{4,5,17,18}

In Bob's case, several findings point to a diagnosis of epileptic psychosis rather than epileptic automatism. First, at the time of the episode Bob had no discernable disturbance of consciousness as described by multiple reliable witnesses. Bob's motor activity was fairly complex and goal-directed. He had clear recall for several parts of the episode — most important, his delusions about the woman he attacked, the brief conversation they had, and the nature of the assault. The psychotic episode lasted more than 24 hours, it occurred more than 48 hours after his most recent seizure, and was not followed by a seizure. Unfortunately, we do not have EEG recordings

from Bob either during the event or during subsequent psychotic episodes so we are unable to comment about brain activity.

In the forensic clinical report, we recommended to the court that Bob be adjudicated not guilty by reason of insanity. In the State of Michigan, a person is legally insane if "as the result of mental illness . . . that person lacks substantial capacity to either appreciate the wrongfulness of his conduct or to conform his conduct to the requirements of the law."²⁴ The definition of mental illness is the existence of "a substantial disorder of thought or mood which significantly impairs judgment, behavior, capacity to recognize reality, or the ability to cope with the ordinary demands of life."²⁵ In his case, the defendant was suffering from a psychotic disorder, with symptoms including delusions and illusions that did impair his judgment and capacity to recognize reality. His conduct was based on the delusion that the woman he attacked was satanic and that God wanted him to destroy her. He did not appreciate that his conduct was wrong either legally or morally but indeed felt it was his sacred duty to attack her. Thus, in our opinion, Bob met the legal criteria in the State of Michigan to be found not guilty by reason of insanity.

References

1. Gunn J, Fenton G: Epilepsy, automatism, and crime. *Lancet* 1:1173-1176, 1971
2. Delgado-Escueta AV, Mattson RH, King L, *et al*: The nature of aggression during epileptic seizures. *New England Journal of Medicine* 305 (12):711-716, September 1981
3. Walker AE: Murder or epilepsy? *J Nerv Ment Dis* 133:430, 1961
4. Bruens JH: Psychosis in epilepsy. *Handbook of Clinical Neurology*, Vinken PJ and Bruyn GW, ed. Amsterdam: North Holland Pub. Co., 1974, pp. 593-610
5. Lishman WA: *Organic Psychiatry*. London: Blackwell Scientific Publications
6. Dorland WAN, ed. *Dorland's Illustrated Medical Dictionary*. 25th ed. Philadelphia: Saunders, 1974
7. Gastaut H, Broughton R, Roger J, Tassinari CA: Generalized non-convulsive seizures without local onset. *Handbook of Clinical Neurology*, Vinken PJ and Bruyn GW, ed. Amsterdam: North Holland Pub. Co., 1974, 130-145
8. Belafsky MA, Carwille S, Miller P, *et al*: Prolonged epileptic twilight states: continuous records with nasopharyngeal electrodes and videotape analysis. *Neurology* 28:293-245, March 1978
9. Delgado-Escueta AV, Bascal FE, Treiman DM: Complex partial seizures on closed circuit television and EEG: a study of 691 attacks in 79 patients. *Annals of Neurology* 11(3):292-300, March 1982
10. Landolt H: Serial EEG investigation during psychotic episodes in epileptic patients and during schizophrenic attacks, In Lorentz de Haas, ed. *Lectures on Epilepsy*. Amsterdam: Elsevier, 1958, 91-133
11. Lorentz de Haas AM, Magnus O: Clinical and electroencephalographic findings in epileptic patients and during schizophrenic attacks, In Lorentz de Haas, ed. *Lectures on Epilepsy*. Amsterdam: Elsevier, 1958, 91-133
12. Sacquena TP, Pazzaglia P, Baldrati A, *et al*: Status epilepticus with cognitive symptomatology in a patient with partial complex epilepsy. *Eur Neurol* 20:319-325, 1981
13. Feindel W: Temporal lobe seizures. *Handbook of Clinical Neurology*, Vinken PJ, Bruyn GW, ed. Amsterdam: North Holland Pub. Co., 1974, 87-107
14. Mayeux R, Leuders H: Complex partial status epilepticus: case report and proposal for diagnostic criteria. *Neurology* 28:957-961, 1978
15. Geier S: Prolonged psychic epileptic seizures: a study of the absence status. *Epilepsia* 19:431-445, 1978
16. Roger J, Lob H, Tassinari CA: Status epilepticus. *Handbook of Clinical Neurology*. Vinken PJ and Bruyn GW, ed. Amsterdam: North Holland Pub. Co., 1974, 145-189
17. Fenton G: Epilepsy and psychosis. *Ir Med J* 71 (9):315-24, June 1978
18. Beard AW, Slater E: The schizophrenic-like psychoses of epilepsy. *Brit J Psychiat* 109:95-150, 1963
19. Kristensen O, Sindrup EH: Psychomotor epilepsy and psychosis. *Acta Neuro Scand* 57 (5):361, 1978

20. Kristensen O, *et al*: Psychomotor epilepsy and psychosis. III. Social and psychological correlates. *Acta Neuro Scand* 59(1):1-9, January 1979
21. Dongier S: Statistical study of clinical and electroencephalographic manifestations of 536 psychotic episodes occurring in 516 epileptics between clinical seizures. *Epilepsia* 1:117, 1959
22. Flor-Henry P: Psychosis and temporal lobe epilepsy: a controlled investigation. *Epilepsia* 10:363-95, September 1969
23. Hermann BP, Dikmen S, Schwartz MS, Karnes WE: Interictal psychopathology in patients with ictal fear: a quantitative investigation. *Neurology* 32 (7):January 1982
24. Public Act 180 of 1974, MCLA 768.21a
25. Public Act 258 of 1974, MCL 330.1400a □