Seizures in a Sleep-Deprived Airman
Case Report, by John E. Miles, MD, MPH

The relationship between sleep deprivation and seizures has been long recognized. Lack of sleep, especially when combined with emotional stress, malnutrition, and heavy alcohol intake likely lowers the threshold for seizures in both known epileptics and normal individuals. This article describes the case of a 33-year-old airline pilot who experienced his first seizure while profoundly sleep-deprived.

History
A 33-year-old male first-class airman with 3,500 hours of flight time was talking to a crewmember while piloting a flight when he suddenly became disoriented. His co-pilot noted that the airman was staring straight ahead and would not respond to questions. After being shaken by the copilot, the airman gradually recovered. He reported that he was somewhat confused for several seconds and did not initially recognize his surroundings, but he then quickly returned to normal. No abnormal motor activity was observed, and the airman did not experience incontinence. Because of a hectic schedule and poor sleep, he attributed this episode to fatigue. He grounded himself and sought medical attention. His primary care provider advised rest.

Two weeks later, the pilot was on vacation, sitting beside a pool, when he experienced a similar episode. He became slightly confused, thinking that the scenery had changed, and he did not recognize anyone or know his whereabouts. The airman described losing awareness and experiencing difficulty focusing. This episode lasted for about 30 seconds. A third and final, essentially identical, episode occurred about one week later. The airman reported that all three episodes had occurred without warning. He denied any abnormal tastes or smells prior to these episodes, but he did feel that one or two of the episodes may have been preceded by a headache.

The airman was referred to a neurologist for further evaluation. He underwent an electroencephalogram and magnetic resonance imaging of his brain. Both tests were normal. His medical history was essentially negative. He had no history of head injuries, unexplained losses of consciousness, or meningitis. He reported occasional headaches but denied any difficulties with memory or decline in mental activities. He reported no visual loss or diplopia and had normal hearing, smell, and taste. He denied paresthesias or weakness. He was taking no medications, smoked approximately a half-pack of cigarettes daily, and denied consuming any alcohol.

The airman did report significant life stressors that contributed to his recent extreme fatigue. He had been experiencing marital difficulties, complicated by a career that required him to be away from home for extended periods of time, and he was now involved in a divorce and custody battle for his children. Long cross-country commutes in order to fly for three to four days left him feeling extremely exhausted. He reported obtaining only two to three hours of sleep nightly and was eating erratically and poorly, especially while traveling.

No abnormalities were noted on examination. Cranial nerves were intact. Romberg, finger-to-nose, and heel-to-shin tests were normal. No pronator drift was observed. Touch, pain, vibration, and proprioception were normal in the extremities and trunk. Gait was normal.

The neurologist diagnosed the airman as having experienced complex partial seizures, likely precipitated by his recent sleep deprivation. The airman was started on Depakote (divalproex sodium), which he took as directed for four to six weeks but then stopped due to weight gain. He was switched to Topamax (topiramate), which he took for five to six weeks but then discontinued it, against his neurologist’s advice.

Aeromedical Issues
In accordance with Title 14 Code of Federal Regulations (CFR), Sections 67.109(a)(b), 209(a)(b), and 309(a)(b), an established medical history or clinical diagnosis of epilepsy is disqualifying for all flying classes. Other seizure disorders, disturbances of consciousness, or neurological conditions may also be deemed disqualifying if they make a person unable to safely perform his or her duties. Although brief in duration,
complex partial seizures such as those experienced by this air-
man pose a significant hazard to aviation safety. Such seizures 
may incapacitate an airman during critical phases of flight, and 
they also have the potential to generalize or progress into status 
epilepticus, incapacitating the airman for extended periods.1

Role of the AME

In accordance with the Guide for Aviation Medical Examin-
ers, a history or the presence of any neurological condition or 
disease that potentially may incapacitate an individual should 
be regarded as initially disqualifying. As detailed above, ep-
ilepsy and other seizure disorders are specifically disqualifying 
for all flying classes. Issuance of a medical certificate to an 
appliant in such cases must be denied or deferred, pending 
further evaluation.2

Prior to consideration for an airman medical certificate, an 
appliant with a diagnosis of epilepsy must be seizure-free for 
10 years, and off anticonvulsant medications for at least three 
years. This requirement applies to all types of seizures. After 
the 10-year period of being seizure-free, a full neurological 
evaluation with EEG is required.3

If an airman experiences only a single seizure, certification 
requirements are somewhat less stringent. If the single seizure 
is determined to be secondary to a known pathological con-
dition, and the cause has been corrected, an applicant may be 
considered for an airman medical certificate after as little as 
a one-year recovery period. A neurological evaluation will be 
needed prior to the issuance of a medical certificate, but no 
follow-up is required.3

An unprovoked single seizure, with no satisfactory medical 
explanation, usually requires a four-year recovery period with at 
least two years off of all anticonvulsant medications. In addition 
to a complete neurological examination, a current EEG, CT, or 
MRI scan of the brain may be required prior to consideration 
for medical certification.3

Outcome

This airman was notified that his most recent report of 
medical examination had expired for the class of certificate for 
which he applied. He was informed that if he were to submit 
a current examination, the FAA would have no alternative 
other than to deny his eligibility for medical certification. The 
aplain may apply for a special issuance after completing the 
10-year seizure-free period and the additional requirements 
detailed above.

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