Stimulus Overload: ‘Video game epilepsy’ causes seizures in young and old

10.31.2009

Late one evening, Ambulance 463 was dispatched for a 24-year-old patient with a reported change in responsiveness. While en route to the scene, dispatch advised 463 to “step it up” because the family had called back and reported the patient’s condition had worsened.

On EMS arrival, the patient was found to be semi-conscious and lying sprawled across a chair in the living room. The patient’s wife said the patient had been playing a video game while sitting only three feet away from the TV. The patient began “acting like he was waving at a fly” and then fell to the floor and began to exhibit tonic-clonic activity. His convulsions lasted only a couple of minutes and were generalized in nature. He had also vomited several times prior to EMS arrival.

The crew found the patient confused and postictal when they began their assessment. In fact, he attempted to get out of his chair and walk around the living room in a dazed state of mind. His initial blood glucose level was found to be 118 mg/dL, BP 150/100, pulse rate 120 and GCS 13. He was helped to a stretcher, but he vomited several more times before he could be secured.

A detailed exam found that his pupils were dilated and slow to react. He had bitten the right side of his tongue during the seizure with no active bleeding noted. He also had a small abrasion to his forehead secondary to the fall from his chair. No other visible trauma was noted.

His chest was clear bilaterally to auscultation with equal rise and fall, and good respiratory effort was noted. The abdomen was soft, non-tender and non-distended, although the patient was obviously nauseated. He was neurologically intact with good movement of all extremities, no facial drooping and no unsteady gait noted.

En route to the emergency department (ED), the patient's ECG revealed sinus tachycardia at a rate of 120, without ectopy. Oxygen was initiated via nasal cannula at 4 lpm, tolerated well by the patient. An IV of normal saline was established with an 18 g angiocath, and the patient was given an initial bolus of 250 cc because of a large volume of emesis.

After initial treatment, the patient became more alert and oriented to his surroundings. Vomiting or obvious seizure activity ceased. On arrival at the hospital, the patient was able to give his date of birth, address and complete medical history.

The patient's hospital evaluation included lab work and a head CT, both of which were normal. He was discharged with seizure precautions and driving restrictions, and given a referral for neurologic follow-up. However, he was brought back to the ED just one week later by another EMS agency after attending a child's birthday party at a local entertainment complex, during which he was around a fire truck ride that featured multiple flashing lights.

During the second incident, the patient experienced migratory numbness from one side of his body to the other and felt like he was going to have another seizure, although he didn't. During his second ED evaluation, his lab results were again normal, and he was placed on anti-seizure medication after consultation with a neurologist. The patient was to follow up for an MRI of his head and further consultation with the referral neurologist.

Video Game Epilepsy

The condition described here is known as "photosensitive epilepsy" (PSE). Other common terms noted in the literature include visual reflex seizures, photoparoxysmal responses, intermittent photic stimulation seizures, video game seizures, television seizures and idiopathic photosensitive occipital lobe epilepsy, just to name a few. This type of seizure activity is triggered by such visual stimuli as flickering or flashing lights from fireworks, video games or TV broadcasts.

TV has been the most common trigger of photosensitive epileptic seizure. In 1997, an episode of the Japanese animated series"ž*Pokà´mon* featuring a rocket launch sequence caused some 700 children and adults aged five to 58 to have epileptic seizures and other related symptoms that sent them to EDs.

Studies have shown that video games, computer games and TV shows produce what is referred to as “flicker stimulus.” In many cases, the flicker is a range of 10à30 flashes per second, a rate which causes epileptic seizures; seizures are not induced at higher or lower ranges.

The distance between the subject and the screen can also play a factor. Typically, a distance of 1.5à2 meters produces flicker stimulus that can induce the seizure activity. In our case study, the patient was sitting about 1 meter from the screen based on the location of the furniture.

Studies with EEGs have shown that these visual stimuli and specific flashing frequency cause epileptiform discharge and present with the clinical features characteristic of epileptic seizures. Recent attempts to minimize the dangers of certain TV and video game photic stimulation images have had varied success.

Discussion

It’s known that PSE is more prevalent in people aged seven to 19, with more males affected because they tend to play video games more than females. Those affected report seeing an “aura” or feeling particularly odd sensations prior to the seizure. The seizures may be generalized or focal, unilateral or bilateral, tonic-clonic or absent (e.g., staring spells).

Contributing causes of PSE include sleep deprivation, alcohol consumption, prolonged video game play, use of subtherapeutic antiseizure medications, sitting closer than 6 feet from a TV screen and use of cocaine, ecstasy or PCP.

EMS crews need to be medical detectives and seek to determine what their patients were doing and what their surroundings are like when doing an assessment of the patient and the given situation. Kids are the target group for video games, but PSE doesn’t discriminate. Older people (over 19) can be just as sensitive to these specific flicker stimuli.

Get a thorough history, and, as always, be sure to conduct a good scene survey so you don’t miss any important clues. Pay close attention to whether the TV is on and if a video game is on the screen, as well as how close the chairs are to the screen.

Because length of video game play can also be a contributing factor to

photosensitive epileptic seizures, ask how long the patient may have been playing the game and if they have any history of photosensitivity. By performing a thorough assessment of patients and scenes, you can have the greatest impact and make patients aware of the dangers of prolonged video game play or TV viewing. **JEMS**

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