Carpe Diem – Seize the Day Blog

Editor's Note: Content presented in the Carpe Diem – Seize the Day Blog is for awareness and ***informational purposes only, and it is not meant to be a diagnostic tool.***

Epilepsy is one of the most common neurological disorders in the world. There are more than 50 million people worldwide living with epilepsy. Photosensitive epilepsy (PSE) is characterized by seizures that are triggered by bright, flickering, or flashing lights. They are sometimes called photoconvulsive seizures. People living with PSE may experience seizure activity while doing normal activities such as watching television, playing video games, riding in a car, or going to a concert or amusement park.

PSE is the most common type of reflex epilepsy. Reflex epilepsy is one of the types of epilepsy that is caused by certain sensory triggers such as light flashes, hot water, emotions, and even reading or thinking.

PSE is linked with a variety of seizures. However, not everyone with PSE will experience other seizures. In fact, about 40 percent of people have only PSE without any other seizure disorder. Some people do not have symptoms but display PSE on an electroencephalogram (EEG) exam. The most common seizures associated with PSE include generalized seizures, such as:

- Absence seizures
- Myoclonic seizures
- Generalized tonic-clonic seizures
- Combination of seizures

Focal seizures can affect the occipital cortex (the part of the brain responsible for vision) and create visual impairments or hallucinations.

About 2 percent to 5 percent of people with epilepsy have photosensitive seizures. Interestingly, among those living with juvenile myoclonic epilepsy (JME), about 40 percent are sensitive to light. Photosensitive seizures can also occur in focal epilepsy that affects the occipital and temporal (the part of the brain closest to the ear) brain regions, but these are less frequently seen. For those living with PSE, about 25 percent will have less severe seizures or be seizure-free after the age of 30.

When light enters the eye, signals are sent to your brain to process the visual stimuli. There are various parts of our brains that help with this process. In people with PSE, their brain activity has an abnormal response to certain visual stimuli (e.g., flashing, flickering, or bright lights), thus triggering a seizure. However, scientists are still uncertain why this occurs.

PSE does not look like a typical epileptic disorder. Most people with PSE do not have brain lesions, structural problems, or abnormalities in their visual cortex (where images received from your retina begin to get processed). There are many parts of the brain involved — the mechanism of PSE is complex, and many brain networks are activated. There are different biological

pathways involved in brain activity and mechanisms that are triggered among different individuals.

Over the past decade, many scientists have proposed genetics as a potential cause for the development of PSE. Researchers have identified mutations found in the CHD2 and GABRA1 genes as risk factors for PSE. Note that having these genetic mutations does not necessarily mean you will develop PSE. More research needs to be done to further understand this theory.

As cited in the journal Epilepsia, PSE tends to affect people aged 5 to 24 years and is more frequently seen in children and adolescents (developmental ages). It is also more common in females. Genetics may also play a role. Many genetics studies have discovered that PSE can pass from one generation to the next and is seen within the same family.

You are at a higher risk of developing PSE if someone in your family has JME. PSE is also seen in people with West syndrome, Lennox-Gastaut syndrome, Dravet syndrome, Jeavons syndrome (also known as eyelid myoclonia with absences), and juvenile and childhood absence epilepsy. PSE triggers depend on the type of light source. Flashes of light between five to thirty times per second are most likely to trigger a seizure. A study found in NEJM Journal Watch states that a long period of light exposure and the color red — which is commonly found in video games — may also cause seizures.
Other triggers include:

- Computer screens and TV screens
- Fire alarms or emergency vehicles with visual lights
- Flashing or flickering holiday lights
- Sunlight reflecting on water or snow
- Strobe lights
- Flickering or rolling images
- Alternating patterns of colors (e.g., striped, or checkered)
- Ceiling fans
- Moving escalators
- Helicopter blades or wind turbines
- Bicycle lights (red and white)
- Faulty fluorescent light bulbs

Everyone’s triggers for a seizure are different. It is important to identify your triggers so that you can try to prevent seizures in the future. Although it is not always possible to avoid triggers, you can try to reduce your exposure:

- Do not sit close to the light source or screen (at least five feet away is recommended)
- Use a small TV (12-inch set).
- Adjust the brightness of screens or use 100-Hz, liquid-crystal display (LCD), or thin-film-transistor screens.
- Do not look directly at the light source.
- Do not play video games or watch TV for a long time.
- Avoid flickering sunlight.
- Avoid flashing TV programs and video games.
- If exposed to provoking stimuli, cover one eye.

- If attending a concert, event, nightclub, or art exhibit, ask in advance if strobe lights will be used.
- Talk to loved ones or a friend about your PSE triggers and how they can best support you during a seizure.
- Reduce stress.
- Avoid sleep deprivation.

The most common type of PSE symptoms includes sensitivity to flickering light, specifically video games and TV. However, not everyone experiences the same combination of symptoms. PSE is seen in various types of epilepsy syndromes, and people may experience a wide variety of symptoms.

Absence Seizure Symptoms
Common symptoms in people with absence seizures include staring blankly, abruptly stopping an activity for a few seconds, pausing midsentence, lip-smacking, or eye blinking.

Myoclonic Seizure Symptoms
Common symptoms in those with myoclonic seizures include quick movements such as muscle jerks or twitches, tics, or unusual clumsiness.

Generalized Tonic-Clonic Seizure Symptoms
Common symptoms in people experiencing generalized tonic-clonic seizures include losing consciousness, losing control of one's bladder or bowel, crying out, and/or experiencing muscle spasms or jerking.

Focal Seizure Symptoms
Symptoms in people with focal seizures are very diverse. Focal seizures can include:
- Sensory changes — Numbness, tingling, hallucinations
- Motor changes — Uncontrollable jerking movements, twitching
- Autonomic changes — Nausea, sweating, increased heart rate, blacking out
- Cognitive changes — Déjà vu, dream-like feelings, flashbacks

Several studies have found that a combination of avoiding triggers and anticonvulsant medications is the most effective treatment plan for people with PSE. Fortunately, the likelihood of achieving seizure control is high. This is especially true for people with JME and pure PSE.

You can best manage and prevent seizures by adopting many of the tips mentioned above. Wearing polarized lenses, dark glasses, or colored glasses (e.g., blue lenses) is an effective treatment option for people with PSE. It is best to reduce or limit alcohol, avoid recreational drugs, practice relaxation techniques (meditation, breathing exercises, or yoga) to reduce stress, and get enough sleep every night to avoid fatigue or sleep deprivation.

Editor's Note: The Carpe Diem – Seize the Day Blog will be distributed and posted weekly.
Always remember – **CARPE DIEM – SEIZE THE DAY!**

Steve.Hutton@epilepsy-ohio.org