

Photosensitive epilepsy

Photosensitive epilepsy (PSE) may be a sort of epilepsy during which seizures are triggered by visual stimuli that form patterns in time or space, like flashing lights; bold, regular patterns; or regular moving patterns.

PSE affects approximately one in 4,000 people (5% of these with epilepsy).

Signs and symptoms

People with PSE experience epileptiform seizures upon exposure to certain visual stimuli. the precise nature of the stimulus or stimuli that triggers the seizures varies from one patient to a different , as does the character and severity of the resulting seizures (ranging from brief absence seizures to full tonic-clonic seizures). Many PSE patients experience an "aura" or feel odd sensations before the seizure occurs, and this will function a warning to a patient to maneuver faraway from the trigger stimulus.

The visual trigger for a seizure is usually cyclic, forming a daily pattern in time or space. Flashing lights or rapidly changing or alternating images (as in clubs, around emergency vehicles, near overhead fans, in action movies or television programs, etc.) are samples of patterns in time which will trigger seizures, and these are the foremost common triggers. Static spatial patterns like stripes and squares may trigger seizures also , albeit they are doing not move. In some cases, the trigger must be both spatially and temporally cyclic, like a particular moving pattern of bars.

Several characteristics are common within the trigger stimuli of the many people with PSE. The patterns are usually high in luminance contrast (bright flashes of sunshine alternating with darkness, or white bars against a black background). Contrasts in colour alone (without changes in luminance) are rarely triggers for PSE. Some patients are more suffering from patterns of certain colours than by patterns of other colours. the precise spacing of a pattern in time or space is vital and varies from one individual to another: a patient may readily experience seizures when exposed to lights that flash seven times per second, but could also be unaffected by lights that flash twice per second or twenty times per second. Stimuli that fill the whole field of vision are more likely to cause seizures than people who appear in just some of the field of vision . Stimuli perceived with both eyes are usually far more likely to cause seizures than stimuli seen with one eye only (which is why covering one eye may allow patients to avoid seizures when presented with visual challenges). Some patients are more sensitive with their eyes closed; others are more sensitive with their eyes open.

Sensitivity is increased by alcohol consumption, sleep deprivation, illness, and other sorts of stress.

Television

Television has traditionally been the foremost common source of seizures in PSE. For people with PSE, it's especially hazardous to look at television during a dark room, at close range, or when the tv is out of adjustment and is showing a rapidly flickering image (as when the horizontal hold is incorrectly adjusted on analog television sets). Modern digital television sets that can't be maladjusted during this way and which refresh the image on the screen at very high speed present less of a risk than older, analog television sets.

Some people with PSE, especially children, may exhibit an uncontrollable fascination with television images that trigger seizures, to such an extent that it's going to be necessary to physically keep them faraway from television sets. Some people (particularly those with cognitive impairments, although most of the people with PSE haven't any such impairments) self-induce seizures by waving their fingers ahead of their eyes ahead of bright light or by other means.

UK television broadcasters require all screen content to pass an automatic PSE and QC test. Previously, the Harding FPA Test was used to assess content, however this has been replaced by software like BATON or Vidchecker. Ofcom regularly updates their definition of a flashing sequence. This is an objective standard of assessment of potential to trigger seizures within the susceptible population. This test isn't currently required internationally. An automatic file-QC system like BATON implements algorithms to detect PSE levels supported by the restrictions described in, Ofcom, and guidelines. The recent versions of BATON support Ofcom, and, there are plans to support also within the upcoming release.

Fluorescent lighting

When functioning correctly, mains-powered fluorescent lighting features a flicker rate sufficiently high (twice the mains frequency, typically 100 Hz or 120 Hz) to scale back the occurrence of problems. However, a faulty lamp can flicker at a way lower rate and trigger seizures.[medical citation needed] Newer high-efficiency compact fluorescent lamps (CFL) with electronic ballast circuits operate at much higher frequencies (10–20 kHz) not normally perceivable by the human eye, though defective lights can still cause problems.[medical citation needed].

Diagnosis

Diagnosis could also be made by noting the correlation between exposure to specific visual stimuli and seizure activity. More precise investigation is often administered by combining an EEG with a tool producing Intermittent Photic Stimulation (IPS). The IPS device produces specific sorts of stimuli which will be controlled and adjusted with precision. The testing physician adjusts the IPS device and appears for characteristic anomalies within the EEG, like photoparoxysmal response (PPR), that are according to PSE and/or may herald the onset of seizure activity. The testing is halted before a seizure actually occurs.

Sometimes diagnostic indicators according to PSE are often found through provocative testing with IPS, and yet no seizures may ever occur in real-life situations. Many of us will show PSE-like abnormalities in brain activity with sufficiently aggressive stimulation, but they never experience seizures and aren't considered to possess PSE.

Treatment and prognosis

No cure is out there for PSE, although the sensitivity of some people may diminish over time. Medical treatment is out there to scale back sensitivity, with sodium valproate being commonly prescribed. Patients also can learn to avoid situations during which they could be exposed to stimuli that trigger seizures and/or take steps to diminish their sensitivity (as by covering one eye) if they're unavoidably exposed. These actions together can reduce the danger of seizures to almost zero for several PSE patients.