HPPD: Understanding Persistent Visual Distortions

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June 17, 2026

Hallucinogen persisting perception disorder (HPPD) is a disorder characterized by a continual presence of visual disturbances that are reminiscent of those generated by the ingestion of hallucinogenic substances. Previous use of hallucinogens by the person is needed, though not sufficient, for diagnosing someone with the disorder. For an individual to be diagnosed with HPPD, the symptoms cannot be due to another medical condition. HPPD is distinct from flashbacks by reason of its relative permanence; while flashbacks are transient, HPPD is persistent. HPPD is a DSM-IV diagnosis with diagnostic code 292.89.

Symptoms

There are a number of perceptual changes that can accompany HPPD. Typical symptoms of the disorder include: halos or auras surrounding objects, trails following objects in motion, difficulty distinguishing between colors, apparent shifts in the hue of a given item, the illusion of movement in a static setting, air assuming a grainy or textured quality (visual snow or static, by popular description, which may also be caused by the normal "blue field entoptic phenomenon"), distortions in the dimensions of a perceived object, and a heightened awareness of floaters. The visual alterations experienced by those with HPPD are not homogeneous and there appear to be individual differences in both the number and intensity of symptoms.

Visual aberrations can occur periodically in healthy individuals - e.g. afterimages after staring at a light, noticing floaters inside the eye, or seeing specks of light in a darkened room. However, in people with HPPD, symptoms are typically so severe that the individual cannot ignore them and HPPD is associated with new visual disturbances. It does not appear to merely increase those already in existence.

It also should be noted that the visuals do not constitute true hallucinations in the clinical sense of the word; people with HPPD recognize the visuals to be illusory, or pseudohallucinations, and thus demonstrate no inability to determine what is real (in contrast to, e.g., Schizophrenia).

Prevalence of HPPD

The probability of developing HPPD after consuming a hallucinogen is unknown. In their review article, John Halpern and Harrison Pope write that "the data do not permit us to estimate, even crudely, the prevalence of 'strict' HPPD." These authors noted that they had not encountered it in their evaluation of 500 Native American Church members who had taken the hallucinogenic cactus peyote on at least 100 occasions. In a presentation of preliminary results from ongoing research, Matthew Baggott and colleagues from University of California Berkeley found that HPPD-like symptoms occurred in 4.1% of participants (107 of 2,679) in a web-based survey of hallucinogen users. These people reported visual problems after drug use that were serious enough that they considered seeking professional help. This number may over-estimate the prevalence of HPPD

since people with visual problems may have been more interested in completing the researchers' questionnaire. The authors reported that 16,192 people viewed the study information but did not complete the questionnaire. If all these people had used hallucinogens without developing visual problems, then the prevalence of serious visual problems in this larger group would be 0.66%. Since these people were not formally diagnosed in person (and may have had visual problems caused by other disorders), this number may provide a reasonable upper limit on the prevalence of HPPD.

It is possible the prevalence of HPPD has been underestimated by authorities because many people with visual problems relating to drug use either do not seek treatment or, when they do seek treatment, do not admit to having used illicit drugs. In the sample of Baggott, only 16 of the 107 people with possible HPPD had sought help and two of these people had been diagnosed with HPPD. Thus, it may be that HPPD occurs more often than is detected by the health care system.

Causes

The cause(s) of HPPD are not yet known. The most current neurological research indicates that HPPD symptoms may manifest from abnormalities in CNS function, following the hallucinogen use. One theory derived from this research is that inhibitory mechanisms involved with sensory gating are disrupted.

In some cases, HPPD appears to have a sudden onset after a single drug experience, strongly suggesting the drug played a direct role in triggering symptoms. But in other cases, people report gradual worsening of symptoms with ongoing drug use. Drugs that have been associated with HPPD include LSD, 2C-E, 2C-I, 5-MeO-DIPT, MDMA, Psilocybin, Mescaline, diphenhydramine, PCP and high doses of dextromethorphan.

Co-existing problems

The visual problems of HPPD can occur along with other mental ailments. Of these, the most prominent are anxiety, panic attacks, depersonalization disorder, and depression. In the sample of Baggott and colleagues, hallucinogen users with persisting and severe visual problems were significantly more likely to report anxiety and depression diagnoses than hallucinogen users without serious visual problems. For example, 25.9% of hallucinogen users with visual problems reported current or past diagnosis of depression. While it is difficult, if not impossible, to establish a clear relationship between the visual and mental symptoms, those with HPPD often testify that a connection indeed exists. For example, anxiety can cause the visuals to become more prominent and vice-versa. Anecdotal wisdom thus maintains that there is a synergistic link between the two. However, there appear to be people with 'pure' cases of HPPD in which no other disorders co-exist.

Treatment

As of yet, there is no cure available for HPPD. The principal treatments seek to reduce symptoms and distress without treating underlying causes. Benzodiazepines including clonazepam (Klonopin), diazepam (Valium) and alprazolam (Xanax) are prescribed with a fair amount of success. Some medications have been contraindicated on the basis of their effects on HPPD or the concurrent mental issues. The atypical antipsychotic Risperidone is reported to worsen symptoms of HPPD during the drug's duration in some people.

Those with HPPD are often advised to discontinue all drug use, many of which are thought to increase visuals in the short-term. There are also less concrete factors that may be generally detrimental to those with HPPD. For example, sleep deprivation and stress are thought to increase HPPD symptoms. However, no published studies have investigated whether any of these recommendations are helpful.

There is no universal time course of HPPD recovery. The adverse psychological effects of HPPD (assuming these effects appeared at all) appear to lessen more rapidly than the visuals; quality of life often returns as a person adjusts. Recovery may be facilitated by a psychological habituation to the visuals, which, in effect, reduces the victim's inclination to attend to and react negatively to them. The deleterious consequences of the visuals can therefore be reduced even if the HPPD does not disappear.

There is currently little reliable information on how often people fully recover from HPPD. There have been reports of HPPD victims having normal perception totally return. The small number of cases of HPPD that have been studied in depth make it difficult to determine how often and under what conditions the visual symptoms of HPPD resolve.

Current Research

A HPPD research program is under development at McLean Hospital, a teaching affiliate of Harvard Medical School. David Kozin, consulting with multiple investigators, is involved in designing HPPD-related research.

Other disorders with similar symptoms

It must be emphasized that individuals without HPPD will sometimes notice visual abnormalities. These include floaters (material floating in the eye fluid that appears as black/dark objects floating in front of the eyes and are particularly visible when looking at the bright sky or on a white wall) and the white blood cells of the retinal blood vessels (seen as tiny, fast-moving and quickly disappearing white specks). Likewise, bright lights in an otherwise dark environment may generate

trails and halos. Most people don't notice these effects, because they are so used to them. A person fearful of having acquired HPPD may be much more conscious about any visual disturbance, including those that are normal. In addition, visual problems can be caused by brain infections or lesions, epilepsy, and a number of mental disorders (e.g., delirium, dementia, schizophrenia, Parkinson's disease). For an individual to be diagnosed with HPPD, these other potential causes must be ruled out.