Delayed-Onset Hypnopompic Visual Hallucinations 20 Years After Initiation of Propranolol Therapy for Systemic Hypertension: A Case Report

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Patient: Female, 88-year-old
Final Diagnosis: Drug-induced visual hallucinations
Symptoms: Visual hallucinations
Clinical Procedure: None
Specialty: General and Internal Medicine • Ophthalmology • Psychiatry

Objective: Unusual clinical course

Background: Visual hallucinations occur in a variety of clinical settings and may be extremely troubling to individuals experiencing them. We report a case of delayed-onset visual hallucinations 20 years after initiation of medical therapy to highlight the importance of considering iatrogenic causes when managing such patients.

Case Report: An 88-year-old woman presented with recurring hypnopompic formed visual hallucinations for the past 20 years. These hallucinations began 20 years after she was started on propranolol to treat her systemic hypertension 40 years earlier. Her hallucinations began with plants and insects. They later progressed to vivid, detailed human figures of different races, ages, genders, and religious personnel such as monks, nuns, and priests. The hallucinations occurred almost daily and upon awakening from sleep. Each episode of visual hallucinations lasted for 10 to 20 seconds, occurring when she awoke after dozing off, multiple times each day. The patient became mentally distressed by her visual hallucinations and began to attribute them to supernatural causes. After substituting her propranolol with atenolol, the patient’s hallucinations decreased dramatically and became rare and non-frightening. The dramatic improvement suggested a drug-induced etiology.

Conclusions: Our case illustrates the importance of considering iatrogenic causes in the diagnosis of visual hallucinations and having a high index of suspicion, even if the onset of symptoms is delayed for many years after initiation of therapy. This iatrogenic condition can easily be rectified to drastically improve the quality of life in affected patients.

Keywords: Charles Bonnet Syndrome • Hallucinations

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Introduction

Visual hallucinations may occur in patients with neurological diseases, metabolic disorders, psychiatric conditions, illicit drug use, Charles Bonnet syndrome and use of certain medications, and may be extremely troubling to individuals experiencing them [1-4]. Propranolol is a potent, non-selective β-adrenoceptor blocker widely used in the treatment of hypertension. The relatively rare occurrence of visual disturbances without confusion can occur in patients being treated with β-blockers like propranolol [5,6]. This can be in the form of hypnopompic hallucinations, visual, auditory or otherwise, that are sensed by a person in their own mind as they awaken from sleep.

A review of the literature shows that this side effect of β-blockers is under-reported and often under-diagnosed. We present a case of delayed-onset hypnopompic visual hallucinations 20 years after initiation of propranolol therapy to highlight this condition.

Case Report

An 88-year-old Chinese woman with a history of systemic hypertension for 40 years and diabetes mellitus for 11 years presented with recurrent hypnopompic formed visual hallucinations for the past 20 years.

Her hallucinations began 20 years after she was first diagnosed with hypertension and started on oral propranolol 40mg twice a day by a cardiologist 40 years earlier. Her hallucinations began with plants (e.g., flowers and trees) and insects (e.g., red-colored ants). They later progressed to vivid, detailed human figures of different races, ages, genders, and religious personnel such as monks, nuns, and priests. The hallucinations occurred almost daily and upon awakening from sleep. The patient and her family initially suspected that her symptoms were related to one of her medications and consulted both her cardiologist and general practitioner about it. However, she reported that they disbelieved her, and dismissed her suggestion that her symptoms were drug-induced.

The patient also sought help from an ophthalmologist who performed her cataract surgeries 4 years later, but again, her symptoms were dismissed by her ophthalmologist who could not offer her a satisfactory explanation for her complaints.

The patient lived with her vivid visual hallucinations which occurred almost daily for 20 years. She initially found the images pleasant and inoffensive but became increasingly worried and frightened when they turned grotesque over the last 5 years. She reported “seeing” frightening-looking Indians with only one eye, other “fierce-looking” people, and a Chinese person lying beside her while she was resting in bed. She reported that the images were trying to touch her but did not actually do so. She also described hallucinations of her dead friends and relatives who beckoned her towards them. Each episode of visual hallucinations lasted for 10 to 20 seconds, occurring when she awoke after dozing off, multiple times each day. She would scream loudly in response to the frightening hallucinations. She did not report any auditory, gustatory, or tactile hallucinations.

The patient became mentally distressed by her visual hallucinations and began to attribute them to supernatural causes. She sought help from monks in a temple who performed religious rituals, but these did not help her condition. According to the patient’s family, at no time was the patient confused or disoriented. She had never attempted suicide or had any suicidal ideation.

The patient had been on oral propranolol 40mg twice a day for 40 years and was also on isosorbide dinitrate (30 mg daily), amlodipine (5mg daily), gliclazide (160 mg twice daily) and metformin (850 mg daily). She had breast carcinoma for which a mastectomy was performed 3 years earlier and was in remission. She was also on oral tamoxifen 20mg once a day. In addition, she had uneventful bilateral cataract surgery 16 years earlier.

She did not have any history of depression, other psychiatric illness, alcoholism, epilepsy, infection, brain injury, stroke, or acute metabolic disorder. There was also no family history of psychiatric illness.

The patient was well and her physical and mental state examinations were normal. She was pseudophakic bilaterally and her best-corrected visual acuity was 20/50 due to dry age-related macular degeneration in both eyes. There was no diabetic retinopathy in both eyes.

When the patient was seen by one of us (KGAE), she was no longer seeing her cardiologist and was being managed by her general practitioner. To determine if her symptoms were related to her propranolol treatment, we requested her general practitioner to substitute her propranolol with another antihypertensive agent. The general practitioner switched her propranolol to oral atenolol 50mg once a day but kept her other medications.

Soon after the drug substitution, the patient’s hallucinations decreased dramatically and became rare, occurring only about once a fortnight. She no longer saw human figures or found the visual hallucinations frightening. Mentally, she was extremely relieved that a doctor had finally diagnosed the cause of her visual hallucinations and was reassured that she was not becoming insane.
As atenolol can also cause hallucinations, we suggested to the patient to replace her atenolol with an alternative medication not associated with hallucinations. However, the patient expressed that she was already extremely satisfied with the significant improvements to her hallucinatory episodes which had become rare and non-frightening and chose to stay on the atenolol. For 4 years after the propranolol was replaced with atenolol, her visual hallucinations remained rare and non-frightening.

Discussion

Hypnopompic hallucinations are brief episodes of dream-like imagery occurring just after waking [7,8]. Our elderly patient with no previous history of neurological or psychiatric disease first developed hypnopompic formed visual hallucinations 20 years after initiation of propranolol therapy for hypertension.

We initially entertained 2 differential diagnoses: (1) delayed-onset hypnopompic visual hallucinations secondary to propranolol therapy and (2) Charles Bonnet syndrome.

In a paper published in 1978, 11 of 63 patients (17.5%) on propranolol in a hypnotherapy clinic reported the occurrence of recurrent visual hallucinations [6].

Charles Bonnet syndrome, first described in 1760, is a condition where patients experience complex, formed visual hallucinations with retention of insight, in the absence of primary or secondary delusions or hallucinations in other sensory modalities [9]. It is thought to be a result of damage along the visual pathway causing visual sensory deprivation. Interestingly, Au Eong and associates described 2 cases of transient Charles Bonnet syndrome which were precipitated by poor vision from visual receptors, although the exact site and mechanism of action are unknown [8,15].

In a double-blind crossover study performed by Westerlund, the hydrophilic β-adrenoceptor blocker atenolol was compared against the lipophilic β-adrenoceptor blockers propranolol and metoprolol in 14 patients who had a previous history of nightmares or hallucinations when treated with lipophilic β-adrenoceptor blockers [15]. Nightmares or hallucinations were reported by all patients receiving lipophilic β-adrenoceptor blockers but by only 3 patients receiving atenolol. In addition, the total number of episodes was significantly lower (p<0.01) for patients receiving atenolol (8) than for those receiving lipophilic β-adrenoceptor blockers (54). Westerlund concluded that atenolol is significantly less likely to provoke nightmares and hallucinations than propranolol and metoprolol and suggested the differences in hydrophilicity amongst these drugs to be the reason for this observation.

In another independent analysis of 12 patients with hypnopompic visual hallucinations, Silber and associates found that 3 were due to β-adrenoceptor blocker use (2 cases with metoprolol and one with propranolol) [8]. Withdrawal of the β-adrenoceptor blockers resulted in complete resolution of the hallucinations, highlighting the importance of considering an iatrogenic etiology. The other cases were associated with anxiety disorder (4), idiopathic hypersomnia (2), dementia with Lewy bodies (1), visual loss from macular degeneration (1) and idiopathic parasomnia (1). The authors noted that the most striking feature of the patients described were the similarity of the hallucinations despite varying ages of onset and presumed etiological factors.

In both studies, it was postulated that the lipophilic β-adrenoceptor blockers such as propranolol block central norepinephrine receptors, although the exact site and mechanism of action are unknown [8,15].

The diagnosis of drug-induced visual hallucinations can be difficult for a few reasons. Many patients do not willingly disclose that they experience visual hallucinations for fear of not being taken seriously or being labelled as mentally unsound by their loved ones and/or their health care providers. Many also do not automatically correlate the occurrence of hallucinations with their medical treatment and therefore do not report these symptoms to their physicians [14,15]. In addition, the hallucinations require a brief period of time after the initiation of therapy to occur, a fact that may account for the patients’ difficulties in correlating the symptoms with therapy [14-17]. In our case, the onset of the propranolol-induced visual hallucinations was delayed for 20 years after initiation of therapy and the condition was missed by the patient’s cardiologist, family physician and her first ophthalmologist. We could have misdiagnosed her condition as Charles Bonnet syndrome had there not been a high index of suspicion for a drug-induced etiology.
Conclusions

Our case illustrates the importance of considering iatrogenic causes in the diagnosis of hallucinations and having a high index of suspicion for drug-induced visual hallucinations, even if the onset of symptoms is delayed for many years after initiation of therapy. This iatrogenic condition should be highlighted more often as it can be easily rectified to drastically improve the quality of life in affected patients.

References: