



CASE REPORT

Visual Snow Syndrome: A Pediatric Case Report with Literature Review

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ABSTRACT

Visual snow syndrome is a benign but underdiagnosed debilitating neurological disorder characterized by a continuous visual disturbance that occupies the entire visual field. It is often described as many tiny flickering dots that resemble the noise of a detuned analog television. Individuals with “visual snow,” as it has also come to be referred to, often experience symptoms like photophobia, tinnitus, migraines, and migraine auras, suggesting a possible relationship between visual snow and migraine disorders. Visual snow is considered its own clinical entity despite the association. We present a case involving a 15-year-old male with attention deficit hyperactivity disorder who presents with visual disturbances, auditory phenomena, and confusion for three days. The patient's symptoms are complex, involving both visual (static vision, blurred vision, seeing shapes and shadows) and auditory (ringing in his ears and hearing laughs) disturbances, as well as a report of disorientation and confusion. Pediatric cases of visual snow syndrome are relatively rare, mostly due to the complexity of diagnosing and the lack of treatment options. Pediatricians should be able to describe and analyze the clinical presentation, diagnosis, and management of the condition, with an emphasis on its impact on the child's vision and overall health. Treatment for visual snow syndrome is important for these individuals, perhaps even more so in young children and adolescents, for several reasons. There is the possible psychological effect of having such unusual and abnormal, undiagnosed visual percepts. Some adult patients with visual snow syndrome indicated their initial childhood reservation about confiding their symptoms to a friend or family member, fearing disbelief and even possible ridicule.

CASE PRESENTATION

A 15-year-old male with a known history of attention deficit hyperactivity disorder (ADHD) presented to the emergency department with a 3-day history of visual disturbances, auditory phenomena, and confusion. The symptoms began suddenly during school and have since persisted. The patient described experiencing static vision, blurred vision, and seeing shapes on the floor and shadows on the walls, in addition to tinnitus (ringing in the ears). He also experienced confusion and disorientation, including a period of amnesia where he required assistance from his sister to remain oriented. The patient denied any recent head trauma, significant physical injury, or changes in his usual school and home routine. Notably, his initial eye pain and pressure resolved, but the visual disturbances and

tinnitus continued. He denied other symptoms, including headaches, dizziness, imbalance, fever, nausea, vomiting, or neck pain, and did not experience diplopia, nystagmus, or any recent trauma. The patient has a history of anxiety, with daily anxiety and occasional panic attacks, including one during school orientation. His family history is significant for bipolar disorder, anxiety, and post-traumatic stress disorder. He has no history of self-harm, suicidal ideation, or substance use. His developmental history includes a period of bullying from grades 3 to 8, but he has been socially well-adjusted since then and is in a stable relationship, though not sexually active. He has been on Aptensio XR® (methylphenidate hydrochloride extended-release) 60 mg daily for ADHD for several years with no recent dose changes or misuse.

Physical examination was unremarkable except for his perception of static images. Laboratory workup, including complete blood count, comprehensive metabolic panel, and a urine drug screen, was normal. Psychiatry consultation recommended a neurology and ophthalmology evaluation given the patient's stable psychiatric status. Pediatric neurology and ophthalmology consultations followed, and imaging studies (CT head, MRA brain, and MRI of the brain, face, neck, and orbits) were normal. No further neurological follow-up was necessary. Ophthalmology evaluation two months later revealed bilateral eye astigmatism, for which glasses were prescribed. The final diagnosis by ophthalmology was visual snow syndrome (VSS), and outpatient follow-up with ophthalmology was recommended.

DISCUSSION

VSS was first discovered and reported in the Transactions of the American Ophthalmological Society by Frank D. Carroll in 1944, and VSS was discovered to be its own medical condition separate from migraine/migraine aura in 1995 by Dr. Grant Liu.¹

Patients with “visual snow” report continuous tiny dots in the entire visual field similar to the “noise” on the screen of an analog television.² As these patients frequently have migraine as a comorbidity, with ophthalmological, neurological, and radiological studies being normal, they are offered various diagnoses, including persistent migraine aura, post-hallucinogen flashback, or psychogenic disorder.³ At this time, VSS is considered a separate clinical entity as it does not respond to migraine treatments.³

It is currently unknown how many patients suffer from visual snow worldwide. Adults with VSS may have reservations about confiding their symptoms, fearing disbelief, dismissal, and even ridicule.⁴ Pediatric cases are often not reported. Available data tell us that there is possibly a higher prevalence of the disease in males and that the average age of affected people is relatively young.⁵

Thankfully, scientific understanding of VSS is growing. However, major challenges remain, including the subjective nature of the disease, its overlap with migraine, and the lack of quantifiable outcome measures, which are necessary for clinical trials. In this context, refined perceptual assessment, objective electrophysiological parameters, as well as advanced functional brain imaging studies, are promising tools in the investigative pipeline.⁶

Electrophysiological studies have revealed cortical hyperresponsivity in visual brain areas. Imaging studies have demonstrated microstructural and functional connectivity alterations in multiple cortical and thalamic regions, and in glutamatergic and serotonergic neurotransmission.⁷

The deficiency of knowledge on the basic biology of VSS has caused a general lack of effective treatment strategies for most affected people. Drugs like migraine preventives, antidepressants, or pain relievers have shown inconsistent results.⁶⁻⁸ Lamotrigine has had some positive effects in some people but lacks robust evidence from clinical trials. Objective documentation of eye movement dysfunctions and advanced brain imaging studies are needed to determine the neural mechanisms underlying VSS. Two promising ophthalmologic therapeutic approaches have emerged, but larger studies are needed to confirm their efficacy. Chromatic tint therapy uses colored filters that help reduce the perception of visual snow, palinopsia, photopsia, and light sensitivity. Oculomotor-based therapy techniques targeting eye movement and saccadic tracking have been shown to reduce palinopsia and improve visual clarity.⁸

Psychiatric comorbidities seem to be quite common in VSS, especially affective disorders such as anxiety, up to 50%, and depression, up to 58%.⁹ The larger concern is the debilitating nature of this chronic illness and the consequences on patients' coping and mental health. VSS patients showed high rates of anxiety and depression, depersonalization, fatigue, and poor sleep, which significantly impacted quality of life.^{9,10}

CONCLUSION

VSS is a benign but significant disorder that can affect pediatric patients and can be associated easily with confounding comorbidities. Although its pathophysiology is not fully understood, recent advances in neuroimaging and electrophysiological studies have provided new insights. Despite the challenges in diagnosis and treatment, management strategies such as chromatic tint therapy and oculomotor-based interventions offer hope for improving the quality of life for affected individuals.² Pediatricians and healthcare providers should remain vigilant in identifying VSS and collaborate with neurologists, ophthalmologists, and psychiatrists to ensure a comprehensive and multidisciplinary approach to patient care. As psychiatric issues such as anxiety in our patient are already a concern, psychological support appears essential in medical management.

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