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Sun, Seizures, And Scholastic Struggles: Recognizing Sunflower Syndrome In Early Childhood

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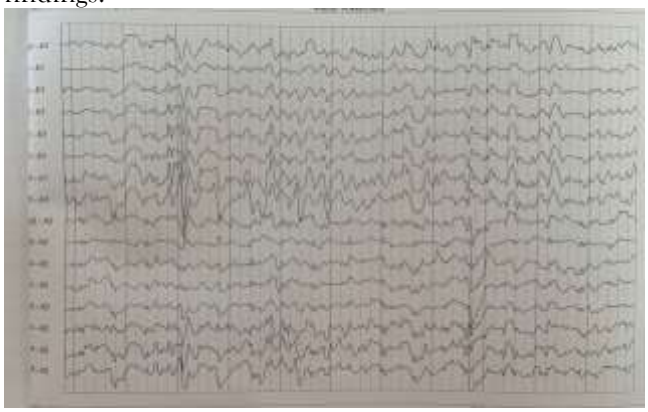
Abstract
Sunflower Syndrome is a rare pediatric reflex epilepsy characterized by stereotyped hand-waving behavior toward light sources, eyelid myoclonia, and seizures triggered by photic stimulation. We report a case of a 4-year-old girl with declining scholastic performance and frequent light-seeking hand-waving episodes. Electroencephalogram (EEG) revealed a photoparoxysmal response with generalized 3–4 Hz spike and polyspike-wave discharges. The patient responded well to valproate and non-pharmacological interventions such as blue-tinted lenses and light avoidance. Her seizure frequency reduced significantly with improvement in attention and learning. This case highlights the importance of early recognition and multimodal management in Sunflower Syndrome. A review of recent literature from 2020 to 2025 is also provided.

CASE REPORT

A 4-year-old girl was brought to the pediatric neurology clinic with concerns of declining scholastic performance and episodes of inattention over the preceding six months. The child had previously met developmental milestones appropriately but had recently shown decreased engagement in preschool tasks, difficulty focusing, and forgetting previously learned letters and numbers. Her parents reported episodes during which she would intentionally face sunlight or a bright artificial light source and rhythmically wave one hand in front of her face. These episodes lasted a few seconds and were often associated with rapid blinking or eyelid fluttering. The child would appear briefly unresponsive during these events and then resume normal activity. No generalized tonic-clonic seizures were reported.

Neurological examination was normal, but her attention span was noticeably poor. Routine EEG showed normal background activity. Video-EEG monitoring with intermittent photic stimulation revealed reproducible stereotyped episodes. The child would turn toward the light, wave her right hand in front of her face, and display rapid eyelid fluttering. These clinical signs coincided with generalized 3–4 Hz spike and polyspike-wave discharges. A robust photoparoxysmal response to frequencies between 10 and 20 Hz was recorded. The diagnosis of Sunflower Syndrome was made based on clinical features and EEG findings.



Treatment was initiated with sodium valproate at a dose of 20 mg/kg/day. In addition, the child was advised to wear blue-tinted lenses and a wide-brimmed hat when outdoors. The classroom seating was adjusted to avoid direct exposure to windows or overhead lights. At follow-up after six months, the frequency of stereotyped hand-waving episodes had reduced from multiple episodes per day to one or two per week. The EEG showed significant reduction in photoparoxysmal discharges. Teachers reported marked improvement in her classroom attention and academic engagement. The parents were satisfied with the outcome and no adverse effects were reported from valproate use.

DISCUSSION

Sunflower Syndrome is a rare reflex epilepsy that typically presents in children between the ages of 3 and 8 years, most often in females. The hallmark feature is heliotropic behavior—voluntarily seeking out light sources—alongside rhythmic hand-waving in front of the eyes and eyelid myoclonia. These episodes are often misdiagnosed as tics, stereotypies, or behavioral issues, especially in young children. Our patient demonstrated all the characteristic features of the syndrome and had associated cognitive and scholastic decline, which improved after appropriate treatment.

Electroencephalographic findings in Sunflower Syndrome typically include a normal background with generalized 3–4 Hz spike or polyspike-wave discharges and a pronounced photoparoxysmal response to intermittent photic stimulation, especially at frequencies between 10 and 20 Hz. It has been established that the hand-waving behavior is not voluntary self-induction but rather part of the ictal event itself, with epileptiform discharges appearing within one second of motion onset[1]. This supports the classification of Sunflower Syndrome as a form of generalized photosensitive epilepsy.

Baumer and Porter have emphasized the frequent underrecognition and misdiagnosis of the syndrome, with delays in diagnosis sometimes exceeding two years[2]. A multicenter Italian study by Belcastro et al. involving 21 children with Sunflower Syndrome reported that 57% were drug-resistant and many required multimodal therapy including blue-tinted Z1 lenses[3]. Valproate remains the most consistently effective antiseizure medication, while other commonly used agents such as lamotrigine and levetiracetam have shown limited efficacy[2,3].

In our case, the child responded well to valproate monotherapy combined with environmental modification and blue-tinted lenses. This aligns with current recommendations favoring combined pharmacologic and non-pharmacologic approaches[4]. The importance of light avoidance, protective eyewear, and classroom modification cannot be overstated, especially in cases where photosensitivity is pronounced.

Fenfluramine, a serotonin-releasing agent initially used for weight loss, has shown promise as an adjunctive treatment in photosensitive epilepsies. A 2021 open-label study demonstrated more than 70% reduction in hand-waving episodes among Sunflower Syndrome patients treated with fenfluramine, making it a potential option for refractory cases[5]. However, its long-term safety and efficacy remain under investigation, and it is not yet approved for this indication.

Cognitive and academic outcomes are increasingly recognized as important in children with Sunflower Syndrome. While most children do not exhibit global intellectual disability, many have impaired attention, learning difficulties, or emotional dysregulation due to frequent ictal events and associated brain network dysfunction[6]. In our patient, a reduction in seizure frequency was associated with improved academic engagement and teacher-reported attention, suggesting that early intervention may mitigate long-term neurodevelopmental impacts.

A 2023 survey of pediatric neurologists revealed that fewer than half were familiar with the diagnostic features of Sunflower Syndrome, underscoring the need for increased awareness[7]. As seen in our case, timely diagnosis using video-EEG with photic stimulation can facilitate targeted treatment and improve both seizure control and developmental trajectory.

CONCLUSION

Sunflower Syndrome is a rare but distinctive pediatric epilepsy syndrome that can present with subtle clinical features and cognitive decline. Early recognition through EEG and clinical observation, combined with pharmacologic and environmental interventions, can lead to significant improvement in both seizure control and neurocognitive outcomes. Raising awareness among clinicians is essential to ensure timely diagnosis and appropriate management.

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