

Co-occurring Epilepsy and Attention-Deficit/Hyperactivity Disorder in a 6-Year-Old Boy

Beth A. Jerskey, PhD,*† Alexis A. Reid, MA,‡§ Karen Spencer, MD, MS, MPH,||¶
Elizabeth Diekroger, MD,**†† Jason Fogler, PhD||¶¶

CASE: “Andrew” is a 6-year-old, right-handed, cisgender boy who presents for neuropsychological testing to determine whether he meets criteria for attention-deficit/hyperactivity disorder (ADHD). Andrew’s parents report that he is easily distracted, has poor concentration, and is unable to sustain attention for discrete periods of time. Andrew is the product of an uncomplicated pregnancy and delivery, and there were no reported concerns in the postnatal period. Andrew met all of his language and motor milestones on time. He was described as having an “easy” temperament in his infancy and toddler years. Difficulties with attention started in preschool in that Andrew was described as frequently “getting lost” in his play or the task he was working on. He was easy to redirect and responded to cues and reminders. Socially, Andrew was described as friendly but not always “picking up on social cues.” Andrew’s kindergarten teachers first noted that sometimes Andrew would “blank out” and appear to stare off, which was attributed to inattention. His teachers brought their concerns to Andrew’s parents, and his parents began to observe Andrew more carefully and noted that these episodes also occurred at home daily. When queried, his parents reported that these episodes would last 4 to 5 seconds and Andrew would not respond to his name being called or to being physically touched. Andrew’s medical history, and that of his immediate and extended family, is unremarkable. Routine hearing and vision screenings are also unremarkable. There are no reports of head injuries or concussions. Andrew’s gait is stable, and there are no signs of motor weakness. There are no reports of sensory seeking or avoiding behaviors. There are no reports of witnessing or experiencing trauma; motor or vocal tics; or compulsions, ritualized behaviors, or restricted interests.

Testing revealed high average verbal comprehension skills, average perceptual and fluid reasoning, and lower end of average working memory and processing speed. During testing, the examiner noted a rapid eye flutter, which Andrew did not see to recognize himself but did ask the examiner to repeat the previous question. Parent and teacher rating scales of emotional and behavioral functioning showed elevations in the areas of inattention and adaptability and 1 scale of executive functioning noted elevations in task monitoring but no other difficulties. Socially, Andrew is well liked by his peers, although he can present as “silly.” He has many same-aged friends and enjoys group activities. His parents have been hesitant to get him involved in sports because he has been known to have these staring episodes right after competing in sporting events. He also tends to have them more often during the school week when he has less sleep, which his parents attribute to having a difficult time falling asleep at night. What would you do next?

(*J Dev Behav Pediatr* 45:e387–e389, 2024)

Alexis A. Reid, MA

Educators spend most of the each weekday with children, and as they have a larger comparison sample of children compared with most of the families, their observations and data may directly assist in the diagnostic process.^{1,2} For example, educators can observe

qualitative phenomena like “spaciness,” coming out of a sleep-like state, time spent on a task without forward momentum or completion, isolation and disengagement from others in social situations, or missing directions or instruction. Students may lose balance, have disorganized speech or communication, or miss cues from peers

From the *Boston Child Study Center, Boston, MA; †The Warren Alpert Medical School of Brown University, Providence, RI; ‡Reid Connect, LLC, Boston, MA; §Merrimack College, North Andover, MA; ||Boston Children’s Hospital, Boston, MA; ¶Harvard Medical School, Boston, MA; **UH Rainbow Babies and Children’s Hospital, Cleveland, OH; and ††Case Western Reserve University School of Medicine, Cleveland, OH.

Disclosure: The authors declare no conflict of interest.

This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Copyright © 2024 The Author(s). Published by Wolters Kluwer Health, Inc.

and teachers. While observing, educators will also need to be mindful of how medical complications and safety concerns, such as falling, hyperventilation during physical exertion, and trouble navigating through buildings or spaces, may show up in the classroom setting or out in the community.

In addition to supporting the diagnostic process through observations noted on standardized rating scales and collateral contact with examiners, educators can provide support and *scaffolds* in real time that help to substantiate the potential source of difficulties and give additional clues about a symptom's potential cause—and environmental factors that might help to mitigate (or exacerbate) it. *Scaffolds* in an educational context refers to an instructional practice in which a teacher gradually removes guidance and support as students learn and become more competent. Educators may provide executive function scaffolds that can support presenting behaviors. For example, frequent check-ins, movement breaks, and reducing or chunking assignments to reduce cognitive load should work for many students with uncomplicated ADHD.³ However, from an educational perspective, responsiveness to these interventions may depend on the primary concern being appropriately addressed and treated. Thus, collecting educational information and data can further inform the treatment for children experiencing the above-described learning or social concerns in an educational context. One should be able to observe growth through support and practice of new skills. After accommodations have been made and fully integrated, if there is still a presentation of spaciness or extreme distractibility, the educator can then check in with the team, school nurse, and parents to determine whether neuropsychological testing or further medical workup might be indicated. All of the above should occur within a supportive culture to facilitate optimal communication with the family and the school team.

REFERENCES

1. Kutcher S, Wei Y, McLuckie A, et al. Educator mental health literacy: a programme evaluation of the teacher training education on the mental health & high school curriculum guide. *Adv Sch Ment Health Promot.* 2013;6: 89–93.
2. Moran K. Anxiety in the classroom: implications for middle school teachers. *Middle Sch J.* 2016;47:27–32.
3. Harrison JR, Bunford N, Evans SW, et al. Educational accommodations for students with behavioral challenges: a systematic review of the literature. *Rev Educ Res.* 2013;83(4): 551–597.

Beth A. Jerskey, PhD

Although not imperative for a diagnosis, children who present for testing with the inquiry of possible ADHD are often referred to neuropsychologists to complete a comprehensive evaluation of functioning given the heterogeneity of symptoms and the question of often co-occurring psychiatric disorders. It is sometimes the case that a child will present with symptoms that may

suggest an entirely different disorder than what the referring party suspected. For example, it is not uncommon for a caretaker or teacher to describe “blank stares” in a child with suspected ADHD, but the length of these episodes (in combination with the child's response or lack thereof) is cause for another consideration of the possibility of absence seizures. In addition, although both disorders share common features, their presentation may be more nuanced (e.g., social difficulties in ADHD may be more related to disinhibition and impulsivity while children with seizures may look more inattentive in social situations). Complicating matters further, the 2 conditions are not mutually exclusive and co-occur up to 40% (or more) of the time⁴ with a similar age of symptom onset.

Although neuropsychologists do not diagnose seizure disorders, there are behaviors worth exploring to determine whether a consultation with a neurologist to rule out epilepsy is warranted. The classical clinical manifestations of typical absence seizures are transient impairment of consciousness (with abrupt onset and offset) accompanied by 1 or more other features such as behavioral arrest, eyelid fluttering, or hand/face automatisms.⁵ The hallmark symptom, however, of this generalized, nonmotor seizure is the presence of the “blank stare.”⁵ Neuropsychologists may wish to further investigate the presence of “glassy eyes,”⁶ changes in breathing patterns, nonresponsiveness to name or touch, loss of control of bodily functions, the display of other behaviors like speech or motor arrest during the episode, and/or significant changes in affective states. Clinicians should also note whether the child has amnesia of the event and whether the child can easily resume normal activity after the spell. Collecting collateral information can also help to build the full picture of the child's experience and challenges. Requesting caregivers to take videos of staring spells can be very useful, as this can help characterize their frequency, onset and offset, and any preceding events. Event calendars/logs can assist in understanding the episodes' frequency, pattern, and possible triggers. For example, it is noteworthy that Andrew has an increase in these staring spells after he has been engaged in physical activity and when he is sleep deprived, both of which would point toward possible epileptic activity. If there is any suggestion of a seizure disorder, either alone or in addition to ADHD symptoms, a referral to a neurologist is highly recommended.

REFERENCES

4. Williams AE, Giust JM, Kronenberger WG, et al. Epilepsy and attention-deficit hyperactivity disorder: links, risks, and challenges. *Neuropsychiatr Dis Treat.* 2016;12:287–296.
5. Penry JK, Dreifuss FE. Automatisms associated with the absence of petit mal epilepsy. *Arch Neurol* 1969;21:142–149.
6. Unterberger I, Trinka E, Kaplan PW, et al. Generalized nonmotor (absence) seizures—what do absence, generalized, and nonmotor mean? *Epilepsia.* 2018;59:523–529.

Karen Spencer, MD, MS, MPH

A standard neurological workup for absence seizures includes a sleep-deprived routine EEG with hyperventilation and photostimulation to identify and document the typical 2 to 3 Hz generalized spike and wave discharges.⁷ Inconclusive assessment findings might lead to further workup for metabolic and neurodegenerative diseases.⁸ If a seizure is identified, an antiseizure medication is started. Typically, ethosuximide is the first-line treatment, followed by other medications used for generalized epilepsies, including valproic acid or lamotrigine. Valproic acid is effective in managing seizures but can also worsen inattentive symptoms. If ADHD symptoms persist after achieving good seizure control, the International League Against Epilepsy (ILAE) recommends treating ADHD with stimulant medications, specifically methylphenidate, as first-line treatment for children with absence epilepsy and ADHD.⁹

Clinicians should be mindful but need not be fearful about dosing. Important considerations when titrating medicines to effect include achieving symptom control without disrupting sleep. However, both absence epilepsy and ADHD are associated with an increased risk of disordered sleep. Disordered sleep can cause excessive daytime sleepiness, which can exacerbate ADHD symptoms and, potentially, increase the risk of seizures.¹⁰ Delayed sleep onset could also result from stimulant medications wearing off either too early or too late.

Although it is common practice to fade neurologist support after attaining good symptom control, there is evidence to suggest that neuropsychological and functional impairments can persist even after the resolution of seizures,¹¹ including symptoms resembling ADHD as well as a wide array of co-occurring psychiatric disorders. Internalized stigma with resulting help avoidance (or rejection) is common to both unaddressed ADHD and epilepsy.¹² The 2 conditions combined may have overlapping and synergistic effects that confer additional levels of impairment and need for additional support.¹³

REFERENCES

- Smith S. EEG in the diagnosis, classification, and management of patients with epilepsy. *J Neurol Neurosurg Psychiatry* 2005;76:ii2-ii7.
- Kessler SK, McGinnis EA. Practical guide to treatment of childhood absence epilepsy. *Pediatr Drugs* 2019;21: 15–24.
- Fonseca Wald EL, Klinkenberg S, Voncken TP, et al. Cognitive development in absence epilepsy during long-term follow-up. *Child Neuropsychol*. 2019;25: 1003–1021.
- Thieux M, Duca M, Voncken TPC, et al. Sleep disorders and ADHD symptoms in children and adolescents with typical absence seizures: an observational study. *Epilepsy Behav*. 2022;128:108513.
- Caplan R, Siddarth P, Stahl L, et al. Childhood absence epilepsy: behavioral, cognitive, and linguistic comorbidities. *Epilepsia*. 2008;49: 1838–1846.
- Cainelli E, Favaro J, De Carli P, et al. Executive functions and attention in childhood epilepsies: a neuropsychological hallmark of dysfunction? *J Int Neuropsychol Soc*. 2021;27:673–685.
- Jacoby A, Austin JK. Social stigma for adults and children with epilepsy. *Epilepsia*. 2007;48:6–9.

Elizabeth Diekroger, MD and Jason Fogler, PhD

ADHD is one of the most frequently cited psychiatric comorbidities in children with childhood absence epilepsy (CAE)¹⁴, and, as noted above, both ADHD and epilepsy have common pathways to similar types of chronic impairment and possible internalized stigma. Given the overlap in symptomatology, an accurate diagnosis is essential—especially given the acutely damaging effects of unaddressed seizures—but can be exquisitely complicated. For example, undiagnosed and untreated seizures increase the risk of functional impairment with the possibility of propagating secondary generalized seizures that puts the health and safety of the child at risk. Limited cross-training between neurologists and psychiatrists (and by extension other mental health practitioners) has been cited as one of the key reasons for this problem in identification.¹⁵ The Complex ADHD Practice Guideline¹⁶ is especially helpful for a case like Andrew's because it guides the clinician to a low threshold for reassessment, emphasizes family education and empowerment—increasing the likelihood of collaborative assessment and shared decision making between team members—and provides a heavily vetted evidence-based assurance that one can treat both seizures and ADHD symptoms pharmacologically.

Key questions remain about whether the diagnosis of seizures versus ADHD-related inattention could ever become more precise. This case highlights the value of multi-informant data, especially from educators or similar kinds of personnel who might see the child throughout the day and have extensive experience with children to draw on for comparison. In addition, it is essential that neuropsychologists have a decision tree about possible differential diagnoses when presented with a case such as this. The quest continues for a common pathophysiological pathway to both ADHD and epilepsy (and by extension, a “one-stop treatment” for both disorders),¹⁷ and until such a pathway is found, reliance on self-report and observational data will remain an important component of long-term management.

REFERENCES

- Caplan R, Siddarth P, Stahl L, et al. Childhood absence epilepsy: behavioral, cognitive, and linguistic comorbidities. *Epilepsia*. 2008; 49:1838–1846.
- Lopez MR, Schachter SC, Kanner AM. Psychiatric comorbidities go unrecognized in patients with epilepsy: “You see what you know”. *Epilepsy Behav*. 2019;98:302–305.
- Barbareis WJ, Campbell L, Diekroger EA, et al. Society for Developmental and Behavioral Pediatrics Clinical Practice guideline for the assessment and treatment of children and adolescents with complex attention-deficit/hyperactivity disorder. *J Dev Behav Pediatr*. 2020;41:S35–S57.
- Gonzalez-Heydrich J, Dodds A, Whitney J, et al. Psychiatric disorders and behavioral characteristics of pediatric patients with both epilepsy and attention-deficit hyperactivity disorder. *Epilepsy Behav*. 2007;10:384–388.

ACKNOWLEDGMENTS

The authors would like to acknowledge Elisabeth Bryan, LICSW, for her contribution to an earlier version of the paper.