Epilepsy and Autism

Because autism is increasingly prevalent and frequently comorbid with epilepsy, children with epilepsy should have autism screening.

By Alyssa R. Rosen, MD

Epidemiology

Epilepsy and autism are both relatively common diagnoses, often made in childhood. The prevalence of autism is increasing, owing to a combination of factors, including changing definitions, increased access to evaluation, and other unknown variables. In the US, prevalence is currently estimated at 1 in every 54 children age 8 years and is much more common in boys (4:1 male to female).\(^1\)\(^-\)\(^3\) Epilepsy prevalence and incidence is more static, at approximately 1 in 147 individuals age 18 years or less.\(^4\)

Comorbidity of epilepsy and autism is frequent; approximately 30% of children with autism have epilepsy and vice versa.\(^3\)\(^,\)\(^5\) The high rate of comorbidity is thought to be caused by genetic and microstructural brain differences. Both conditions predispose individuals to abnormalities in neural connectivity, although the exact pathophysiology of both conditions remains unknown. There is evidence for epigenetic factors playing a role in some situations. For example, children who have infantile spasms during critical windows of social and language development (6-18 months) are more likely to later develop autism.\(^6\) There are also syndromes in which a known single gene mutation confers a high risk for both epilepsy and autism (ie, fragile X syndrome).

Diagnostic Evaluations

Possible Autism in People With Epilepsy

Autism is, in part, defined by the presence of repetitive stereotyped atypical behaviors. These can often raise alarm for seizures in parents and caregivers. For example, the common autistic tendency to stare off, “zone out,” or withdraw into an internal world may look like an absence seizure. Repetitive sensory stimulation or stereotypies may appear similar to focal seizures. Careful history-taking is paramount in differentiating seizures from nonepileptic events and critical both to avoid misdiagnosing seizures and to avoid missing a diagnosis of autism (Box 1). Considering this phenotypic overlap, clinicians should maintain a high index of suspicion for autism in children with epilepsy or those seen for evaluation of events concerning for seizures (Box 2). Children who screen positively for developmental delay or autism should be referred for comprehensive evaluations sooner rather than later, because early identification and intensive remediation are shown to improve outcomes for autistic individuals.\(^7\)\(^-\)\(^9\)

Possible Epilepsy in People With Autism

Although a high index of suspicion for seizures is important in individuals with autism, it is also important to avoid the pitfall of misdiagnosis based on the presence of EEG abnormalities alone without a convincing clinical history. Baseline EEG abnormalities are even more common than epilepsy in individuals with autism. Some studies have shown that up to 60% of people with autism will have EEG abnormalities,\(^10\)\(^,\)\(^11\) even without seizures, making the possibility of false positive EEG results high. The EEG findings in autism might be seen as an epiphenomenon of the underlying pathophysiology of the disorder and a reflection of a difference in neural connectivity, rather than a marker for seizure risk, per se. As in all populations, EEG should be used as a tool in the overall clinical evaluation for epilepsy and taken in the context of a thoughtful clinical history. Use of EEG in an individual with autism is warranted only when there is clinical suspicion for seizure, in which case the EEG may provide supporting evidence for or against a diagnosis of epilepsy. This is especially true for those individuals who have aggression or sensory sensitivities that can make the EEG procedure particularly difficult to tolerate. When EEG is clinically necessary for someone with autism, it is important that caregivers and clinicians prepare them in advance to avoid trauma around the procedure as much as possible.

Treatments

Autism

There is no curative treatment for autism, however behavioral and pharmacologic interventions can considerably ameliorate the burden of symptoms and improve functional status and quality of life for individuals and families. Autistic people may receive educational and other accommodations, such as having a 1:1 support person in regular education classrooms or special education services. All individuals providing care, education, or therapy should receive training for seizure first aid and have access to an individualized safety plan that includes a “seizure action plan” and recommendations for
safety around water, driving restrictions if the individual is of driving age, and more. If an individual is at risk for wandering or elopement, is nonverbal, or spends time unsupervised, a medical alert bracelet or similar identification including both diagnoses is appropriate.

Individuals with autism and epilepsy are more likely to have intellectual disability, specific learning disabilities, and attention deficit hyperactivity disorder (ADHD). Therefore, educational and neuropsychological evaluations are critical to inform individual education plans (IEPs) and 504 Plans, which ensure appropriate accommodations are made for those who are of school age. It is important to inform parents the additional diagnosis of epilepsy makes it more likely a neuropsychological evaluation will be covered by insurance. The presence of both autism and epilepsy may affect the implementation of both educational and medical interventions. For example, periods of high seizure burden or medication changes may introduce dynamic changes in academic functioning that need to be accommodated in individual education planning. For the medical provider, medication changes might be best made during school breaks or periods when changes are not also occurring in the child’s environment.

**Epilepsy**

Once there is a confirmed diagnosis of epilepsy in a person with autism, treatment should begin—usually with anti-epileptic medications. Valid screening tools are available and take 5 to 20 minutes to administer. Additional training is not always needed to screen for autism spectrum disorders (ASD). Inclusion of parental input does not decrease validity of screening.

### Ages and Stages Questionnaires (ASQ)

- Age-specific parent-completed questionnaire evaluating overall development including fine- and gross-motor skills, problem-solving and adaptive skills, and communication skills.

### Parents’ Evaluation of Developmental Status (PEDS)

- Parent-interview screens for development and behavior problems requiring further evaluation.

### Modified Checklist for Autism in Toddlers (MCHAT)

- Parent-completed questionnaire designed to identify children at risk for autism who should be referred for further evaluation.

### Screening Tool for Autism in Toddlers and Young Children (STAT)

- An interactive screening tool comprised of 12 activities assessing play, communication, and imitation skills.

### Box 1. Clinical History-Taking in Autism and Suspected Epilepsy

**Tips**

- Remember that repetitive and stereotyped behaviors are common in autism and not necessarily seizures.
- Note that children with autism may not be able to verbalize their subjective experience, even when they have high verbal abilities.
- Elicit first-hand accounts from parents, teachers, and caregivers.
- Have caregivers video events of concern, which allows for clinician observation and has become easier to obtain with video capabilities on most smartphones.
- Ask caregivers to describe what they see step-by-step.
- If parents and caregivers are comfortable doing so, ask them to act out what happened.
- Ask if the episodes have a consistent duration.
- Ask if the same thing (e.g., going to sleep) always happens after an episode.
- Remember people with autism may be very internally preoccupied and calling their name or waving a hand in front of their face may not get their attention; touch is more useful to gauge responsiveness.

**Pearls**

- Episodes that occur only in a specific context, such as when a child is in their highchair or attending speech therapy, are less likely to be seizure activity and more likely to be a response to an environmental or sensory trigger.
- Variable duration of the episodes—sometimes 10 seconds, sometimes 10 minutes—are less likely to be seizure activity.
- Episodes that occur across environments and look the same every single time with a defined start and end to the episode are more worrisome for seizure.
- Unresponsiveness to vigorous touch elevates concern for seizure; caregivers can be coached to touch the person as soon as possible when an episode begins to see if that changes the behavior.
- The presence or absence of a postictal period may increase suspicion for seizure.

### Box 2. Available Screening Evaluations for Autism

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seizure medications (ASMs) with the understanding that individualization of therapy is critical. The mantra of “start low and go slow” for titration of ASMs is even more important than usual for people with autism, who in general, have more sensitivities to the environment, including medications.

It is also important to be mindful of whether or not different formulations of an ASM are available and which formulations will be easiest for the individual to tolerate (and the caregiver to administer if needed). The taste, smell, and mouth feel of an ASM that may not bother most can be very bothersome to autistic individuals. Consider whether liquid formulations are available or if pills can be crushed for individuals, especially children and adolescents, who may have difficulty swallowing pills for a longer time than is seen in people without autism.

Conclusion
Autism and epilepsy are frequently comorbid conditions, and it is important to maintain a high index of suspicion for one when the other is present. Screening for autism is warranted in people with epilepsy. Careful history taking should be used to differentiate potential seizures from other repetitive or stereotyped behaviors. Careful diagnostic evaluations, with thoughtful use of EEG testing, can improve diagnostic accuracy and treatment of both conditions when they co-occur.


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