



ABSTRACT

Recent studies have shown that individuals with an autism spectrum disorder (ASD) are at an increased risk of developing psychosis. Diagnosing psychosis in such individuals can be challenging when they present with symptoms at a young age. A careful history and thorough assessment are essential for proper diagnosis to avoid mislabeling certain behavioral problems encountered among children with ASD. We present the case of a 12-year-old child with atypical autism who developed psychotic symptoms that led to a diagnostic dilemma. Proper exploration of early childhood history, prompt treatment with an antipsychotic medication, and social skill training led to resolution of psychotic symptoms and improvement in disruptive symptoms of autism.

Keywords: Autism, psychosis, association, autism spectrum disorder, ASD

Psychosis in a Child with Atypical Autism: A Case Report and a Brief Review of the Association of Psychosis and Autism

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Since the concept of psychosis by Blueler¹ and Kraepelin² first emerged, autism spectrum disorder (ASD) was thought to be an early manifestation of psychosis or schizophrenia, and ASD in children was referred as “childhood psychosis” or “schizophrenic syndrome of childhood.”³ On the basis of similar findings in brain regions, neurotransmitter systems, genetic markers, linguistic traits, impaired attention, theory of mind, and neuropsychological dysfunction, ASD and schizophrenia/psychosis have been proposed to be on two ends of a spectrum related to the social brain.^{4,5} The exact prevalence of psychosis in individuals with ASD is not known, though some studies have reported that individuals with ASD are at an increased risk of developing psychosis.^{3,6,7} It often becomes a diagnostic dilemma when an individual with a previous diagnosis of ASD presents with psychotic experiences. The situation becomes more challenging if the individual is a child (i.e., <13 years of age). The existing literature in this area suggests that the deficit symptoms of schizophrenia and symptoms of ASD are very similar, causing a boundary overlap during diagnostic assessments. Patients with ASD often have intellectual disability and are unable to clearly express psychotic experiences. They might present with disruptive behavioral problems, which can be difficult to treat. Here, we present a case of a 12-year-old male child with atypical

autism who developed psychotic symptoms. Challenges in diagnosis, including differentials, and treatment are discussed.

CASE VIGNETTE

Patient A, a 12-year-old boy, was second in birth order and was delivered full-term by normal vaginal birth with no prenatal, perinatal, and postnatal complications. He was in the fifth grade of school and was from middle socioeconomic status with no family history of mental illness. He was brought to our child and adolescent psychiatric outpatient services by his parents, who reported that he had been exhibiting abnormal behavior and fearfulness for the last year. Compared to his elder sister, he had a delay of 2 to 3 months in achieving speech and motor milestones of development, and 3-to-4-month delay in social smiling and recognition of his mother. There was no history of significant physical illness.

The parents reported that since early childhood, Patient A was less communicative with his siblings and children his age and/or with family members. He used only a few words and often did so in a hypernasal tone. He would not approach or make eye contact with any guests at home and would start crying if his mother ever forced him to interact with any person who was not familiar to him. Patient A was disinterested in attending social gatherings, would not initiate interaction or

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play with other children, and would make gestures to return back home. There were no symptoms suggestive of separation anxiety at home or at social situations. In school, he would not interact with teachers or classmates, he would sit alone, and he would not play with other children or show any interest in making friends. He would not share with his teachers or parents any positive experiences, nor would he report any negative experiences, even if he got injured. The teachers frequently reported communication problems they encountered with him, and he refused to participate in oral exams. At home, he preferred to play alone, preferring activities that required the least participation from others (e.g., he would play with puzzles or blocks). If his parents offered something new or special to his elder sister, he would not show any anger, emotional distress, or jealousy, seeming unconcerned. His eating, sleeping, and playing times were regular, and any deviation from his daily schedule would make him irritable. His school performance was below average.

Continuing in this pattern, one year prior to presentation, without any apparent reason, the Patient A became disinterested school and began watching cartoons and or other programs with magical themes more frequently. The patient would become irritated if anyone tried to sit near him while he was watching television, preferring to watch alone, which was unlike his previous behavior. He would also lie in bed with his head covered under a blanket in the evening hours, offering no explanation. Additionally, he appeared self-absorbed and was often seen smiling to himself and doing odd gestures in the air. At times, he would go outside and make similar hand gestures pointing toward the sky, and when inside, would jump from one chair to other, saying he had great magic power, without any further elaboration. His irritability began to last throughout the day and he would become angry without provocation, destroying household articles. These symptoms continued to worsen, leading to the necessity of removing him from school. His self-care and appetite reduced. He would not sleep at night, seeming fearful, and would scream without any apparent reason. Additionally, he displayed signs of suspiciousness and fear when anyone would come into the home, and he would physically try to make them leave.

At times, he appeared fearful and would cry without any apparent reason and be difficult to console. He would not allow his mother to leave him even for few minutes, even when going to the toilet, which was unlike his previous behavior. His interaction with his parents deteriorated. There was no history of seizures, fever, and head trauma.

On a mental state examination, the patient did not initiate eye contact and was irritable. He was admitted to our child ward for observation. Hematological and routine biochemical, thyroid function, and serum calcium tests, as well as electroencephalogram and magnetic resonance imaging assessments, were normal. Urine examination for any abnormal metabolites was negative. Following admission, a diagnosis of atypical autism with unspecified psychosis as per *International Classification of Diseases-10 (ICD-10)*⁸ was considered. He was treated with risperidone tablet 2.5mg/day, and his symptoms of fearfulness, suspiciousness, and irritability significantly improved within three weeks of inpatient stay. After he was stabilized, nonpharmacologically applied behavior analysis (ABA) was performed in a systemic manner, and social skills training to improve communication and social interaction, speech therapy, and activity scheduling was initiated. Three attempts were made to assess intelligence quota (IQ) but were unsuccessful due to uncooperativeness of the patient. At Day 45, Patient A was discharged from our facility in a clinically stable state. He continued a regimen of risperidone 2.5mg/day and social skills training on an outpatient basis and eventually was able to return to school. He was still symptomatically stable at the 1.5-year follow-up visit, though he continued to struggle academically.

DISCUSSION

ASD is often difficult to diagnose unless a careful early childhood and developmental history is taken. In the case presented here, a diagnosis of atypical autism was given, despite our patient's signs of early developmental impairment that is often apparent in typical cases of autism. Unlike childhood autism, in our patient, there was insufficient demonstrable abnormalities in all three areas of psychopathology that are required for the diagnosis of autism (i.e., dysfunctional social

interaction and communication skills [verbal and nonverbal] and restrictive, stereotyped, repetitive behavior), despite characteristic abnormalities in other areas, according to the *ICD-10*.⁸ For example, our patient was able to communicate his needs to his parents and did not have any repetitive or stereotyped behavior. Psychosis in a child with symptoms of autism is difficult to diagnose because such individuals might not be able to report psychopathology. We also considered a differential diagnosis of childhood onset schizophrenia (COS). Presence of positive symptoms is a critical component of COS diagnosis.⁹ There was no clear evidence of hallucinations in our patient, but there was evidence of delusions (as suggested by patient's report of magical powers), symptoms of fearfulness and suspiciousness, and episodes of excessive, unexplained irritability, screaming, and agitation. Studies have reported that about 27 percent of patients with COS often meet the criteria of ASD prior to the onset of psychosis,^{10,11} and these children present with symptoms of brief and transient psychosis; episodes of emotional lability disproportionate to the stimuli; a lack interpersonal skills; cognitive deficits in processing information; and with no clear evidence of formal thought disorders.¹² Our case met many of the criteria for COS present, making this a possible differential diagnosis.

The increased risk of association between psychosis and autism has been hypothesized in many ways. First, long-term avoidance of gaze and eye contact in children with autism can lead to lack of social development,¹³ which can lead to underdevelopment of theory of mind.¹⁴ These social cognition deficits can lead the individual to inaccurate inferences of mental states when aware of being looked at by others, which subsequently can lead to symptoms of paranoia and/or psychosis.¹⁵ Second, neurobiological studies have found that amygdala has a significant role in mediating theory of mind skills in autism.^{16–18} Similarly functional neuroimaging studies in schizophrenia have also demonstrated under-activation of amygdala compared to controls, in recognizing facial expression and emotions.^{19–23} The under-activation of amygdala suggests reduced cognitive capability in individuals with ASD or schizophrenia.²⁴ Third, there is good evidence

regarding the hypo-activation in the mirror neuron systems in ASD, which is usually associated with mentalistic cognition and identification of cognitive and emotional resonance during social interactions.²⁵ Recent studies on the mirror-neuron system underlying facial perception and emotional resonance in schizophrenia have also demonstrated dysregulation in the context of emotion inappropriate to social context and flat affect.^{26–28} These findings suggest that deficits in the mirror neuron system in ASD could progress to develop psychotic symptoms.

A recent review article documented evidence from several retrospective studies (conducted on patients with schizophrenia) and from longitudinal studies of children with ASD and onset of psychosis later in life and suggested that is a link between ASD and the psychosis spectrum disorders.²⁹ This further broadens the concept that psychosis can develop in individuals with ASD, from both biological and clinical perspectives. With regard to symptom overlap between ASD and schizophrenia, the negative symptoms of schizophrenia, such as affective flattening, alogia, avolition, apathy, anhedonia, and poor communication, are observed as components of social interaction impairments in individuals with ASD, more particularly among those with high functioning ASD (previously referred to as Asperger's syndrome).³ These symptoms are assessed thoroughly in adolescence, but it is often too difficult to assess the symptoms in late childhood—as in our case. Obtaining a clear history of early development and overall longitudinal course of illness, including recent changes in symptom characteristics, are needed before making a diagnosis.³⁰

Accurate and prompt identification of psychosis in ASD is important to ensure proper treatment. Brief reactive psychosis or acute and transient psychosis should be part of the differential diagnostic exercise as there is evidence of these in individuals with ASD in the context of increased stress and anxiety. Psychosis might be diagnosed in individuals with ASD if certain problematic behaviors occur in response to a disrupted routine, but these usually resolve without the need for medication and with the introduction of a structured routine.³¹ In our case, the psychotic symptoms were not brief, they did not resolve quickly, and they did not appear to be related

to a disrupted routine. The symptoms resolved with antipsychotic medication (risperidone) after three weeks. Risperidone was chosen because it is one of the FDA-approved medications for disruption and irritability in children with ASD. The only other FDA-approved antipsychotic medication for children with autism is aripiprazole.^{32,33} IQ testing should be attempted in all children with ASD once they become cooperative or should be attempted once psychosis has stabilized. In our case, working with the parents, particularly the mother, on how to properly use behavioral interventions helped the patient long term.

CONCLUSION

In cases of childhood psychosis, the clinician should maintain a high suspicion of COS. In cases of ASD, a careful and detailed history of early development and course of illness should be obtained to identify or rule out any symptoms of psychosis, as there is a strong link between schizophrenia and ASD. Distinguishing symptoms of psychosis from other symptoms of ASD is critical for optimal treatment in this challenging group of pediatric patients.

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