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Clinical Handbook of Child and Adolescent Psychiatry



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CHAPTER 12

Schizophrenia and Other Psychotic Disorders

Jasmin Garg, Nitin Gupta

INTRODUCTION

Psychosis is characterized by disruptions in cognition, perception, and behavior, leading to impaired reality testing. Psychosis is a distinctive feature of schizophrenia, but it can occur in many other neuropsychiatric conditions such as mood disorders, substance intoxication, delirium, neurological disorders, etc.[1-3]

Diagnostic criteria for schizophrenia and other psychotic disorders for children and adolescents are the same as for adults, as described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the International Classification of Diseases (ICD-11). The primary psychotic disorders mainly include schizophrenia, schizoaffective disorder, schizotypal disorder, acute and transient psychotic disorder, delusional disorder, and other psychotic disorders.

The diagnosis of psychotic disorders is challenging in children and adolescents due to their unique developmental concerns. Misdiagnosis is very common. The onset of schizophrenia before 18 years of age is known as early onset schizophrenia (EOS), and before 13 years of age, it is known as childhood onset schizophrenia (COS).[4,5]

The prevalence of psychotic disorders in children and adolescents has been reported to be approximately 0.5%. The peak age of onset of schizophrenia is from 15 to 30 years.[4] EOS constitutes about 25% of cases of schizophrenia.[6] COS is extremely rare and data from Western countries have reported the approximate prevalence of COS as 0.04% with slight male preponderance.[3,5] The validity of the diagnosis of schizophrenia has not been established in children below 6 years of age.[3]

CHARACTERISTICS OF SCHIZOPHRENIA OF CHILDHOOD AND ADOLESCENT ONSET

The symptoms of EOS and COS identical with those of adult-onset schizophrenia, characterized by hallucinations, delusions, disorganized speech, disorganized behavior, and negative symptoms. However, hallucinations are more common in children and they may be multisensory. Delusions are less intricate and infrequent in children. Flat affect and disorganized speech are common, while catatonia is less reported.[1,4,5] These children may have subtle problems in their premorbid social and cognitive functioning. There can be an associated history of speech and developmental delay. Typically, at the onset of illness, the child becomes more withdrawn socially, his/her academic performance declines, and then there is expression of unusual thought content. Schizophrenia in this age, thus, generally has an insidious onset.[3,4,7] Here is an example of a case of typical childhood-onset schizophrenia **(Case Vignette 1)**.

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CASE VIGNETTE 1

An 11-year-old boy was a student in the 5th class in 2022. He is a known case of cerebral palsy with weakness in the right side of his body. He was going to school regularly and doing well in studies. He had a few friends and occasionally played with them in the evening. In 2022, when the Ukraine-Russia war broke out, the child became increasingly engaged in watching news about the conflict. He would not go to play with peers as before. He would not interact much with parents, and when they tried to talk to him, he would mainly speak about the war, such as Putin said those things, sent fighter jets to Ukraine, and so many people were dead. After some months, they observed him talking to himself, smiling without apparent reason, and staring at the ceiling for extended periods. They also noted a decrease in his sleep, with episodes of smiling, talking, and gesturing throughout the night. When they asked the reason, he would say things like, "Someone is calling me, do not know who, may be Putin is calling me; Putin is standing outside the door; Zelensky is using abusive language; I can hear jets passing over us." He would also claim that he was seeing news reporters, dead bodies, and Putin's palace in his vision. When parents confronted him, he would become irritated and shout at them. The patient's school teacher also observed a noticeable decline in social interactions. He became increasingly withdrawn, often sitting alone at the back of the classroom. He exhibited self-muttering and self-smiling, appeared self-absorbed, and stared at the wall for extended periods. Additionally, there was a noticeable delay in his responses during class activities. Academically, his performance began to deteriorate. He became irregular in school attendance and faced difficulties in passing examinations. He would be so lost in muttering and gesturing that he would not listen to his parents. His parents had to call his name loudly and repeatedly, or they would clap loudly to bring his focus toward them. He would not agree to change clothes and take a bath. Afterward, the patient was taken to a psychiatrist and was prescribed tablet Olanzapine 2.5 mg/day. Over 6–8 months, the dosage was gradually increased to 15 mg. While there was some improvement in his sleep patterns, there was no significant amelioration of his other psychiatric symptoms. He would not go to school. He would also talk about hearing and seeing things he watched on TV news channels and YouTube videos. He would often start rocking while muttering and gesturing, saying that it was due to the effect of a ghost that he saw in a video.

In 2024, he was taken to another psychiatrist and was prescribed tablet Risperidone 2 mg/day gradually increased to 6 mg/day. The patient remained compliant with the prescribed medications, and his symptoms began to improve. He started going to school regularly, but did not study much. His self muttering and gesturing decreased. His parents did not have to clap to make him listen. He would comply with their requests to change clothes and take a bath. However, his speech became unclear with medicine due to extrapyramidal symptoms (EPS). So, after about 6 months of follow-up with this medication, the patient was taken to another psychiatrist who prescribed tablet Risperidone 4 mg/day. He was also given aripiprazole 5 mg/day. His magnetic resonance imaging (MRI) brain was done, and findings showed a paucity of white matter with areas of gliosis in the left periventricular/peritrigonal region, suggestive of an old hypoxic insult. His Intelligence Quotient (IQ) on Malin's Intelligence Scale for Indian Children (MISIC) was 76, indicating borderline intellectual functioning. There was no improvement in his symptoms. He would exhibit occasional verbal aggression toward his parents. He would talk about hearing the voice of Prime Minister Narendra Modi and conflicts with China. Currently enrolled in the 7th grade (April 2025), he continues to sit at the back of the class,

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refrains from interacting with peers, and does not attend school for the entire duration of the school day. On mental status examination (MSE), he had continuous self-muttering, gesturing, and self-smiling. His speech was slurred due to EPS. His tone and reflexes were increased on the right side of body compared to the left. He also had a mild squint in the right eye. He was dressed appropriately to culture, weather, and situation. He did not make eye contact, and rapport could not be established. He would intermittently start rocking back and forth on the chair. The examiner had to repeat the interview questions several times to bring his focus to the present. He would begin answering a question and then get distracted and start self-muttering. Derailment was also evident in his thought process, as after speaking a sentence related to the question, he would jump to an entirely new topic, e.g., he was talking about seeing a ghost rocking in a chair, then he jumped to experiencing Akbar Birbal's court around him, and also told that he felt some power of the gurus within him. He also said he felt people were looking at him everywhere and talking about him. But he could not elaborate on it further. Auditory hallucinations were elicited for multiple persons. He said that Prime Minister Narendra Modi was saying, "Our nation is not free after so many years, it is time for a change, now there will be a revolution." He also said that a lady told him he should not study. If he studied, his parents would meet with an accident and they would fly in the air. Visual hallucinations were also elicited. He said he was seeing Putin's palace before his eyes. There were carpets in front of the palace. It was clearly visible to him. There was someone inside the palace looking at him. It was a scary doll moving around in the palace. He acknowledged that the palace was visible only to him, and no one else could see it. When asked if he could imagine visualizing something else, he said it was stuck in his eyes. He could not move it. In the assessment of cognitive functions, he could not cooperate much. He lacked insight into his illness.

This patient had florid psychotic symptoms. He would remain aloof and lost in his world. He had multi-sensory hallucinations and formal thought disorder. Children with schizophrenia mainly have hallucinations rather than delusions. He had cognitive decline, as previously he would get 90% marks, and now he had difficulty passing the exams. His symptoms did not improve with different antipsychotics. He also developed EPS with the medicines.

These children have more negative and cognitive symptoms compared to adult-onset schizophrenia. They exhibit a higher frequency of neurological soft signs involving frontal and temporal lobes compared to adolescent onset and adult-onset schizophrenia.[8] The majority of the patients with COS have impaired executive functioning, as demonstrated by neuropsychological testing. Their single-photon emission computed tomography (SPECT) scans reveal perfusion anomalies in the left frontal and temporal lobes, according to a study from North India.[9] They have lower N-acetyl aspartate (NAA) in the dorsolateral prefrontal cortex and hippocampus. Their brain atrophy is more marked and progressive compared to adult-onset schizophrenia.[10]

The clinical course usually involves the acute phase (with florid positive symptoms), recovery phase, and residual phase (with negative and cognitive symptoms). Children require long-term treatment with antipsychotics, and most of them develop moderate-to-severe disability across the lifespan. The earlier the onset of schizophrenia, the poorer the prognosis.[4,7,11] Compared to later age onset schizophrenia, patients with childhood-onset have poorer functioning, academic performance, lower intelligence quotients, florid phenomenology, and poorer response to treatment.[12]

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PRODROME

A prodromal phase may precede the acute phase. There can be subthreshold psychotic symptoms during prodrome lasting weeks to years.[13] Prodrome may manifest as academic deterioration, social withdrawal, irritability, and depressive and anxiety symptoms.[1]

Since schizophrenia is a chronic, disabling mental condition, researchers have been trying to recognize those in prodrome or those with a high risk of developing schizophrenia so that its onset can be prevented. Different criteria for the identification of patients with a high risk for the development of psychosis have been made. These are of three subtypes: (1) Attenuated psychotic symptoms: occurrence of positive symptoms (delusions, hallucinations or formal thought disorder) at a lesser intensity than schizophrenia in the past 12 months. (2) Brief limited intermittent psychotic symptoms: fleeting positive psychotic symptoms that resolve spontaneously within a week. (3) Genetic risk: when there is a positive family history or traits of schizotypal disorder along with mild functional deterioration.[4,7,13]

Tools such as the Comprehensive Assessment of At Risk Mental States (CAARMS) and the Structured Interview for Psychosis-Risk Syndromes (SIPS) are used to identify young individuals in high-risk states.[5,7]

However, using these criteria, only 20% of identified individuals reportedly develop psychosis in the long term. Secondly, most research studies on identifying prodromal states recruited treatment-seeking young individuals for nonpsychotic problems. So, the identified individuals in prodromal states usually have other mental disorders such as anxiety disorders, mood disorders, or other behavioral disorders.[13]

Research is underway to predict at-risk states accurately and to find efficacious therapies to manage those in high-risk states. Antipsychotics have not proved efficacious so far. Omega 3 fatty acids have been tried with mixed results. Selective serotonin reuptake inhibitors (SSRIs) and nonpharmacological need-based therapies may be effective.[4,5]

DIFFERENTIAL DIAGNOSIS OF SCHIZOPHRENIA IN CHILDREN AND ADOLESCENTS

In this age group, often, it is challenging to establish a diagnosis of schizophrenia or psychotic disorders. The following case vignettes will demonstrate the elusiveness of diagnosing. Many times, it takes numerous sessions of history taking and mental status examination to reach a diagnosis. It is common for children to have a fear of ghosts during this phase of development. They have vivid imagination and fantasy **(Case Vignette 2)**.

CASE VIGNETTE 2

An 8-year-old boy, a student of class 3, was brought to psychiatry outpatient department (OPD) with the complaint of an episode of unresponsiveness in school. The boy was found lying unconscious on the school washroom floor the previous day. The latch of the washroom was open, and the boy was found lying fully clothed. There was no urinary incontinence or injury due to a sudden fall. There was no history of a tongue bite. There was no past history of seizures. There was no history of any complaints from the school regarding his behavior. He would play with his friends normally during his free time. The patient's mother reported that the child used to remain scared of ghosts at home. He would not go to the washroom alone at night for about 7–8 months. He was doing well in his studies.

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His sleep and appetite were normal. During the mental status examination (MSE), the boy was cooperative and communicative and had a euthymic effect. He explained that he had gone to the school washroom and when he was alone, a headless man wearing black clothes suddenly appeared in front of him. The man tried to catch him and he got scared and fainted. The child also reported feeling scared and alone at home as his parents were working and his elder sibling was busy with her studies. He was scared to go to the school ground as he believed the see-saw and swings would sometimes start moving independently. The child was challenged that ghosts were not real. May be there was no one in the washroom, and probably the swings moved by wind. To all that, the child vehemently refused, said he was telling the truth, and actually saw what he described.

This boy accepted seeing ghosts with conviction. His parents also reported that he felt scared at home and refused to go to the washroom alone at night from 7 to 8 months. However, the child's socio-occupational function and biological functions were normal. There was no history of any academic decline. Even though the child seemed to have experienced visual hallucinations, he did not have schizophrenia.

The parents were suggested to spend quality time with the child. On follow-up, the child maintained well with psychosocial interventions. Many months later, he confessed that he had not seen any ghosts in the washroom and had made up the whole story.

Falsely held beliefs must be evaluated carefully in the context of developmental age. Up to 5% of normal children may report psychotic or psychotic-like symptoms.[1,5] Psychotic-like symptoms are also common in dissociative disorders in children **(Case Vignette 3)**.

CASE VIGNETTE 3

A 13-year-old male child, student of class 7, living in a joint family, resident of an urban area, belonging to a middle socioeconomic status, presented to the psychiatry outpatient department (OPD) with his mother and uncle with a psychiatric illness of approximate duration of 4 months. His birth and developmental history were uneventful.

As per the mother, his illness began with the complaint of pain in the abdomen, which was diffuse in nature and no associated symptom was found. He was taken to multiple doctors, but not much relief was reported. After 2 weeks, one day, he suddenly started saying, "Lord Hanuman is calling me. I have to meet him." The next day, the family took him to a temple, hoping he might recover. He visited the temple happily, and nothing unusual was noticed in his behavior. However, he started screaming on the way home, "There is Mata Rani (Goddess) in the car. She wants biscuits. She is calling me." The family took him to a faith healer, and he improved for some time. He continued to have similar symptoms periodically at home. He started remaining fearful at home and would keep clinging to his mother. He would say, "There is an old lady with long hair wearing white clothes, and I am scared of going outside." He also had anxiety and headaches off and on. The patient continued consulting faith healers. Meanwhile, the patient developed episodes of unresponsiveness with involuntary movements not associated with any tongue bite, injury due to falling or incontinence of urine. There was a history of 2–3 episodes/day in the beginning, which gradually increased in frequency. Due to this, the family avoided sending him to school. His sleep and appetite were normal. The family took him to different

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psychiatrists, and he was prescribed various psychotropics such as tablet aripiprazole 20 mg, tablet olanzapine 10 mg, tablet escitalopram 10 mg, tablet clonazepam 0.5 mg, tablet valproate chrono 300 mg BD, tablet sertraline 50 mg OD, and others. There was no improvement with medicines.

There was a history of conflicts within the family that increased with the patient's grandmother's death around 6 months ago. There were frequent fights between the parents, and since then, the father has been staying separately from the rest of the family.

The patient was admitted to the psychiatry ward for observation and diagnostic clarification. During mental status examinations (MSEs), he was found to be normally built and dressed appropriately. Psychomotor activity was normal in some MSEs; at other times, he would become unresponsive during interviews. He would become responsive again after sitting quietly without any intervention. The speech was coherent and comprehensible. In the thought content, he would say Hanuman ji and Mata Rani come to him. Suggestibility was evident in his behavior as he would say yes to most questions asked to elicit phenomenology. It could not be found explicitly whether he had thoughts, possessions, or hallucinations related to deities. Later, MSEs revealed worry related to himself and his family. During ward admission, it was observed that he would intermittently develop episodes of unresponsiveness, more so when the mother would forbid him from watching the smartphone. The patient was diagnosed according to ICD-10 as F44.4 (dissociative motor disorders). Psychosocial management was initiated.

It is common for normal children and adolescents to have imaginary friends. Younger children may have imaginary friends in the form of animals or birds. Imaginary friends may also be present in children with anxiety spectrum disorders **(Case Vignette 4)**.

CASE VIGNETTE 4

A 14-year-old female presented to psychiatry outpatient department (OPD) with complaints that she would smile too often for around 1 year. Also, she would communicate less with teachers and would not give answers to the questions asked in class. She was average in her studies and liked to draw in her free time. She was introvert by nature and would not talk much. During history taking, when the examiner was communicating with parents, the patient felt no one was looking at her, she was observed to be self-muttering. During mental state examination (MSE), the patient answered the greetings and sat comfortably in the chair. She was normally built and dressed according to social and weather situations. She was noticed smiling inappropriately when asked many questions during the interview. Eye-to-eye contact was maintained. Rapport was established. The mood was stated to be alright. But she appeared anxious in affect. She reported that whenever she would go to new surroundings or in front of teachers, whenever she felt nervous, she would not be able to control the smile on her face. She felt nervous while talking to teachers and unknown persons. When asked the reason for self-muttering, she reported that she had been hearing a voice coming from within herself. The voice was perceived as that of a girl who was her secret friend. She felt she lived by her side and came to talk to her whenever needed. Whenever she had something that she could not share with anyone, she would whisper it to that girl, and she would give a solution to the problem. The voice would talk only when the patient spoke first, and it was not distressing to her. Rather a pleasure for her.

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This patient had psychotic-like experiences, yet her overall clinical picture did not fit with that of schizophrenia. She had self-muttering, but it was not due to true hallucinations. Also, children with schizophrenia usually have associated cognitive decline, which she lacked. Her inappropriate smiling and decreased communication were due to social anxiety.

Obsessive compulsive disorder (OCD) can be frequently misdiagnosed as schizophrenia in children and adolescents **(Case Vignette 5)**.

CASE VIGNETTE 5

A 16-year-old boy presented to psychiatry outpatient department (OPD) with a history dating back to when he was around 11 years of age and started becoming irritable with children coming for tuition from his mother. He expressed that they made fun of him. The intensity gradually increased through associated acts (fighting with them, avoiding sitting for studies during that time). Then, one day, he came home from school and said that a girl from his school lived in a cupboard at his house. He would not let anyone open it, citing that she would enter his body if done so. Over the next few days, he started reporting that he was seeing Mahatma Gandhi in his home and would avoid specific places where he would see him. After a period of a few months, he started expressing that another girl was sitting on one of the couches at home and would not go near it and not sit on that particular seat, saying she would enter his body, which he felt in the form of heaviness. He would then restrict himself to a bedsheet on the floor, not allowing it to be touched, changed, or cleaned. He also started scratching his face, causing visible lesions and scabs, citing that the girl's face was sticking to it.

Over the next few months, his self-care decreased. He started avoiding school with multiple days of absenteeism. He also started getting abusive and, at times, assaultive toward a stray dog in the locality, saying every time it barked, something would get into his brain, he felt irritated, and his head would get heavy. He would say that when it barked, some or other form of quarrel occurred at their house. Also, he started having repeated thoughts on seeing his housemaid that his day would be spoiled by looking at her. He would not be able to control the occurrence of this thought. He would ask his mother to fire her from her job. He had reassurance seeking in the form of confirming every information from the teacher and asking his mother to call his teacher in the evening and check if he had heard the things and homework correctly in school. He stopped using the tap in the bathroom, saying his uncle first went near the side of the sofa where he felt the girl sit, and then he touched the tap. So, she had now entered the bathroom (saying he saw a black shadow of the girl in the bathroom and that she would enter inside his body from there). He then started wearing some threads on his wrists and neck to protect himself from her. He also would avoid some specific roads from where his maid's son would come to their house, saying he would get repetitive thoughts that he had a bad eye on his mother, and these thoughts would be tough to control and cause him irritability. Then he was brought to the psychiatrist (after about 2 years of onset of illness), and at that time, it appeared that he had schizophrenia. He was started on tablet risperidone 2 mg, which was gradually increased to 8 mg over 3–4 months. There was an improvement in aggression with this. Later, 50 mg of tablet fluvoxamine was added, which was gradually increased to 200 mg. Skin picking, thoughts about the housemaid and her son, anger outbursts over the dog, and the visual and tactile phenomenon improved. He started attending school and participating in sports, winning 2 gold and a bronze medal. Academic interest and performance remained average.

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Initially, the patient was diagnosed as having schizophrenia by the psychiatrist. He expressed that he would see a girl from his class sitting in his cupboard and Mahatma Gandhi, which were thought to be visual hallucinations. He also expressed that he would feel the girl entering her body and felt her on his face, which were believed to be somatic hallucinations. His illness was severe and functional impairment was also present. However, on reviewing the longitudinal history and case work-up, the diagnosis was revised to OCD with absent insight. The patient predominantly had obsessions throughout his course of illness, which he believed to be true. He had obsessional images of his classmate, Mahatma Gandhi, and magical thinking regarding the stray dog and the housemaid. He was very aggressive toward stray dogs, yet aggression is an inherent part of OCD. There was difficulty in eliciting obsessions initially, as whenever mental status examination (MSE) was done, he would affirmatively state that he would see that girl sitting there. This patient gradually improved, and the academic and functional decline was transient. There was no residual cognitive decline.

Sometimes, it becomes challenging to differentiate COS from autism spectrum disorder (ASD). Children with ASD have deficits in communication, poor socialization, restricted repetitive behaviors, sensory issues, speech delay, or loss of once-acquired speed. They may have associated intellectual disability, catatonia, hyperactivity, irritability, and aggressive outbursts. The communication problems and isolated play may resemble negative symptoms of schizophrenia. Stereotypic speech may be present in ASD, which may be confused with formal thought disorder.[1,4,5] Also, children with ASD may have self-talking behavior owing to auditory hyposensitivity. Self-talking may be confused with self-muttering due to hallucinations **(Case Vignette 6)**.

CASE VIGNETTE 6

Mr A, a 12-year-old male child, student of 6th class, resident of a rural area of North India, belonging to a lower socioeconomic status, presented to the psychiatry outpatient department (OPD) with his father with a continuous psychiatric illness of a total duration of 2–3 years.

His illness began when he was around 9–10 years old and was studying in the 4th grade. Family members started observing that he began to withdraw socially, spending hours alone, avoiding interaction with his family and friends, showing a delay in responding and decreasing academic performance. Around that time, he was also observed talking to himself and telling his family members that some people were always talking about him. Sometimes, he would cover his ears, and when asked why, he would say that he was hearing voices of people and wanted to block them. He occasionally displayed inappropriate emotional responses, such as laughing without apparent reason and becoming extremely anxious and fearful. He would not go to school regularly, and when he went, the teachers would observe him muttering to himself. He would not focus in the classroom or interact with other children. Teachers would also complain that when they tried to communicate with him, it was difficult for them to understand what he said. He had also started becoming irritable, shouting and hitting others for minor reasons. After around 1 year of onset, they visited a psychiatrist who prescribed him tablet risperidone 2 mg/day and valproate 250 mg/day. But he was not given the medicines regularly. He was taken to temples, where various poojas were performed. His symptoms kept on increasing in severity. He remained aloof and often said people were talking bad about him and wanted to harm him.

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When some guests would visit their house, he would not tolerate them and tell them to go away or become aggressive towards them. His self-care deteriorated. He would not agree to take a bath or change clothes. He exhibited more physical aggression. He would bite family members when they asked him to take bath or any minor issue. He continued to have self-muttering, and when asked, he would say that he was hearing voices coming from speakers and batteries. Due to all these complaints, he was brought to psychiatry OPD again. He had attained all the developmental milestones for his age but delayed language milestones until he was 5 years old. He also had mild problems speaking from that age, as his father said that often, what he said would not be comprehensible to people other than his family. He would not play much with children of his age and used to talk less from the beginning. He was not good at studies, according to his father.

On mental status examination, he entered the doctor's room with his father, dressed appropriately for the culture, weather, and situation, but unkempt (clothes were dirty, hair not groomed or combed). Hallucinatory behavior was observed, including gesturing, muttering, and self-smiling. Eye contact was not sustained, and rapport was not established. The speech was low volume, at times incoherent and incomprehensible. Affect was indifferent. In content of thought, he expressed that people talked about him and wanted to harm him but did not elaborate. He said he heard voices from speakers and batteries but did not give details. In higher mental functions, he did not cooperate well on attention and concentration and memory testing, showed impaired abstract ability and judgment, poor fund of knowledge, and absent insight.

This child had childhood onset schizophrenia (COS) as he had positive symptoms in the form of auditory hallucinations and formal thought disorder. He had negative symptoms as he would remain withdrawn, had poor self-care, and had an indifferent affect. He also had a history of speech delay and subtle language problems. He was not much social from the beginning. History of premorbid cognitive, social, and language problems are often found in COS.[1,3] Children who develop COS can have lower intelligence quotients premorbidly, like this boy's father reported that he was not good in studies from the beginning.

He had mild dysfunction in the premorbid period. However, he did not have gross deficits in interaction or restricted repetitive behavior amounting to autism spectrum disorder (ASD).

Certain pointers help distinguish ASD from COS. First, in the case of COS, there is a history of a substantial period of grossly normal development. The onset of COS can be insidious, but it is distinct. Symptoms of ASD begin very early and a normal period of development may be absent or very brief. Secondly, there is a lack of positive symptoms (hallucinations and delusions) in children with ASD, although symptoms mimicking negative symptoms may be present. Thirdly, the premorbid dysfunction in COS is not as severe as in the case of ASD.[1,3] Still, the possibility of ASD comorbid with EOS should be kept in mind as up to 30% of children with ASD may develop psychosis.[5]

Mood disorders with psychotic symptoms are often misdiagnosed as schizophrenia in children. Mania with psychotic symptoms can be associated with florid delusions, hallucinations, and formal thought disorder. The social withdrawal of depression may be mistaken for negative symptoms. Depression with psychotic symptoms may present with mood-congruent or incongruent delusions. History taking should be done carefully and repeat interviews should be conducted in case of doubt in the diagnosis before initiating treatment.[1,3,5] EOS should also be differentiated from schizoaffective disorders **(Case Vignette 7)**.

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CASE VIGNETTE 7

A 13-year-old female studying in 7th presented to psychiatry outpatient department (OPD) with her mother. The patient denied any complaints, while the mother reported decreased sleep for 15 days, fearfulness, crying episodes, and muttering to herself for around 7 days. The symptoms appeared around 3 weeks after menarche and progressed in intensity. No past psychiatry/medical/surgical history. She was an adopted child through some agency, so little is known about her biological family. On examination, she entered the room and started scanning around. Psychomotor activity was increased in the form of difficulty keeping seated, moving in and out of the chair, and also out of the room. Active hallucinatory behavior in the form of self-muttering and gesturing was noted. There was difficulty in sustaining eye-to-eye contact. Rapport could not be established. The mood was subjectively stated to be fine, but the effect was much anxious. She reported hearing voices of multiple persons. The voices talked about her, "She is a transgender." Voices commanded her to act like sitting up, standing up, moving there, etc. She said that she had to obey the voices. If she did not obey the people of the voices, she experienced pain in her head, and she would feel they were hitting her on the head. During the interview, she would start crying, saying she was being hit on the head when she was saying things that they were forbidding her to. During mental status examination (MSE), she suddenly ran out of the room, saying that a person wearing black clothes and a scary face had come to the doctor's room. She described the person vividly. Paranoid ideations could be elicited, but further thought content was difficult to elicit on the first MSE. The patient was started on risperidone 2 mg and gradually increased to 8 mg/day. With this dose, a partial remission was achieved in psychotic symptoms. During subsequent MSEs, she would continuously mutter to herself, and when asked any question, she would say, "See, now you know what I was thinking." She said that everybody knew what she was thinking. Her family also reported that there were incidents in which she would go and kiss some boys in public. The patient reported that she had to do that because she had to obey the voices. She went to school irregularly. Her academic performance was poor. After around 8 months of the onset of symptoms, she presented to the OPD with symptoms such as excessive grooming by using make-up, she would boast about herself that she was the most beautiful girl in the world, she would start talking to anyone she met, pressurized parents to buy a new car, there was decreased need for sleep and she would roam around excessively. She had elated mood, increased rate of speech, increased self-esteem and persistent auditory hallucinations auditory hallucinations were persistent. Oxcarbazepine 600 mg/day was added, which led to improvement in manic symptoms. However, other psychotic symptoms continued. Her academic performance kept deteriorating. Different antipsychotics were tried to control her hallucinations.

This patient had auditory hallucinations, visual hallucinations, and tactile hallucinations (multisensory) as psychotic symptoms. Auditory hallucinations persisted during most of the illness. She developed symptoms of a manic episode, which lasted around 1 month while auditory hallucinations were continuing. A diagnosis of schizoaffective disorder was considered but could not be made as it could not fulfill the ICD-10 or DSM-5 criteria for the same. According to DSM-5, mood symptoms should be persistent for most of the illness, yet in this patient, auditory hallucinations were present for most of the illness.

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Literature reports that schizoaffective disorder is one of the most misdiagnosed disorders and has questionable reliability.[1,5] Transient manic symptoms can occur during the longitudinal course of schizophrenia.

Adolescents may also develop acute and transient psychotic disorders (ATPDs), which resemble schizophrenia.[14] Previous studies from India have also reported that the occurrence of ATPD is common in adolescents[15] **(Case Vignette 8)**.

CASE VIGNETTE 8

Mr X, a 14-year-old male child, student of class 9, resident of a rural area, belonging to a middle socioeconomic status, presented to the outpatient department of psychiatry with his parents with a history of psychiatric illness of 3 days. His birth and developmental history were uneventful.

As per the informant, his illness began 3 days back when his half-yearly exams were going on, and he suddenly became fearful and puzzled. He returned from school and said he was talking to someone during the exam, and the principal scolded him. He said that due to this, everyone at school was talking ill about him, and he was being made fun of. When his parents reassured him, he calmed down for some time but started saying these things again. He could not focus on his studies. His sleep and appetite decreased. He refused to go to school for the next exam, saying other students thought bad about him. He was reluctant to leave home, saying that people were talking bad about him and would harm him. The parents asked his school teachers and friends whether something odd had happened in school. But nothing relevant could be found.

On mental status examination (MSE), the patient entered the examiner's room and sat on the corner of the chair. He was looking anxious. He was dressed appropriately according to the weather and situation. Eye-to-eye contact was made but not sustained. His attitude was evasive and rapport could not be established. Psychomotor activity was normal. The speech was normal. Affect was perplexed. In thought content, he said, "I was talking to my friend and the principal came to the room. He scolded me and went back." When asked to explain more about the incident, he did not give details but said, "Others think wrong about me, but it is not so. I do not have a girlfriend, but they think so." He did not explain much again. When asked whether he felt scared of leaving home, he said that people would harm him, but no further relevant answer was given. The thought content was suggestive of primary delusions. No perceptual abnormality could be found. He did not cooperate much in the testing of higher mental functions. Insight was absent.

The patient was diagnosed with acute and transient psychotic disorders (ATPDs) and prescribed tablet risperidone 1 mg and tablet clonazepam 0.25 mg. He followed up after 1 week and reported that he was completely fine.

Psychotic symptoms can occur in the context of medical conditions in children such as epilepsy, neoplasms, autoimmune encephalitis, endocrine disorders, central nervous system (CNS) infections, genetic syndromes such as velocardiofacial syndrome, inborn errors of metabolism, Wilson's disease, delirium, and so forth.[1,3,5] One should carefully rule out medical conditions when there is an acute onset of psychosis associated with signs of organicity, such as focal neurological deficits, infection, seizures, confusion, or catatonia.[4]

Exposure to certain drugs, e.g., corticosteroids, dextromethorphan, anticholinergics, amphetamines, and antihistaminics can lead to the development of psychotic symptoms

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in children. Psychosis can also manifest after exposure to substances of abuse such as cannabis, inhalants, and stimulants. Acute psychosis due to drugs remits within days to weeks after stopping the causative drug. Cannabis use may lead to the development of schizophrenia ultimately.[1] Some common differential diagnosis are shown in **Box 1**.

There can be psychiatric comorbidities in children with EOS or COS, such as anxiety disorders, OCD, depression, etc. In children and adolescents, phenomenology evolves gradually, and the diagnosis may change longitudinally[3] **(Case Vignette 9)**.

BOX 1: Differential diagnosis of schizophrenia in children and adolescents.

- Normal fantasy
- Dissociative disorders
- Anxiety spectrum disorders
- Obsessive compulsive disorders
- Mood disorders
- Autism spectrum disorders
- Medical and surgical conditions
- Drugs and substance abuse
- Acute and transient psychotic disorder

CASE VIGNETTE 9

Ms X, a 20-year-old unmarried female, presented to the psychiatry outpatient department with her uncle with a continuous psychiatric illness of a total duration of 4–5 years. At the time of her birth, she was relinquished by her biological parents as they believed that keeping her would impede their chances of having a male child in the future. She was taken care of by her paternal aunt and uncle.

Her illness began when she was 16-year-old and was studying in class 9th. She had moved back to her parents' house. Initially, she started remaining irritable. After some months, she told her sister that she was getting repeated disturbing thoughts in her mind that she was having intercourse with God. She was very distressed due to these thoughts. Her symptoms escalated when she started having persistent thoughts that someone would reveal her secrets, contributing to increased anxiety and social withdrawal. When asked about the secret, she expressed fear that her nude video might have been leaked. Her academic performance also declined from before. Gradually, over 5 to 6 months, she started saying that people in the neighborhood were talking badly about her. She experienced auditory hallucinations occasionally, as if someone was calling her name. Her condition kept on deteriorating. She wouldn't go to school. Her self-care decreased, and her sleep was disturbed. Her parents took her to faith healers. She would suspect her parents that they had done black magic on her and she would remain very irritated with them. She came back to her paternal uncle's house within a year. She would often complain that someone had made her doll and was poking needles in the doll and she was feeling pain in her body because of that. She would also express that someone was controlling her mind and someone forced her to make a nude video of herself and share it online, which she did not want to do. She was taken to a psychiatrist by her paternal uncle. She was prescribed fluoxetine 20 mg, gradually increased to 60 mg/day and also aripiprazole 10 mg was added. She was on continuous treatment for about 2 years. Despite adherence to medications, only partial remission of symptoms was achieved. She could not continue her studies. She persistently believed that somebody was trying to control her, and she believed that she was made to sing songs at night as someone would move her lips, and she could not stop herself. She often said such things happened because her parents did black magic on her. She also had magical thinking. She would say that if I did not do things in a particular way, something bad would happen. She would advise her uncle to choose a particular route while going out. Otherwise, his trip would not be successful.

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On current MSE, she had dressed appropriately for culture, weather, and situation. The speech was coherent and comprehensible. Affect was anxious. She expressed that some people, including her parents, were making her do things through a doll and she could not stop herself. She also expressed that she was getting repeated sexual thoughts in her mind that she should have intercourse with boys or talk to them. She said she knew she should not do so, but these thoughts were put in her mind through black magic. Her judgment was impaired and insight was absent.

This patient had obsessions in the beginning. Initially, the psychiatrist had prescribed fluoxetine for obsessions. However, during the course of her illness, psychotic symptoms became predominant. She had delusion of control, somatic hallucination, and thought insertion. So, this patient had OCD comorbid with EOS.

MANAGEMENT

Diagnostic assessments include history taking and physical and neurological examination. Those with suspected schizophrenia should be evaluated for comorbid medical conditions, substance abuse if any and level of functioning.[4] Diagnostic status should be reviewed over time as diagnosis tends to change in children and adolescents.[1] Certain diagnostic interview tools like the Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS) may be used, which may aid in making the diagnosis.[4,5]

There are no diagnostic laboratory, psychological or neuroimaging tests for psychotic disorders. Cognitive assessment may be done for suspected comorbid intellectual disability and academic planning. Extensive investigations may be required in case of psychotic symptoms related to delirium or neurological illnesses. Neuroimaging and electroencephalogram (EEG) may be required in case of epilepsy.[1,4] Investigations should be done judiciously in children, as in previous research reports >98% of the time, the results of investigations are normal.[16] Routine investigations such as complete blood counts, liver function tests, fasting blood sugar, lipid profile, and electrocardiogram (ECG) may be done before starting antipsychotics for recording baseline levels.[5]

Antipsychotics are the primary treatment for the management of schizophrenia in children. The antipsychotics are of two types. The D2 antagonists (First-generation antipsychotics or FGA) and serotonin dopamine antagonists (SDA or second-generation antipsychotics). Studies from both adults and youth have demonstrated that no antipsychotic is superior in effect to another except clozapine.[1,5,7]

Long-term treatment spanning years is usually required in schizophrenia. An effort should be made to continue effective doses at minimum side effects. The FGAs are more often associated with extrapyramidal side effects than SGAs, which are more likely to produce metabolic side effects. Most guidelines suggest that lower doses should be started in children and slow up-titration should be done. Children are more sensitive to adverse effects of antipsychotics when compared to adults.[1,4]

SGAs have a comparatively favorable side effect profile, so they are usually started first in children.[4] All SGAs except asenapine and ziprasidone demonstrated efficacy in the management of schizophrenia in the young population.[3,5] However, most recommendations for antipsychotic use are based on adult studies as there are comparatively limited studies in the young population.[7]

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While starting antipsychotics, the patient and family members should be explained about the options, possible side effects, the importance of adherence, and the need for monitoring. They should also be explained in terms of maintaining a healthy lifestyle, exercising, and taking dietary precautions.[4] There is limited research available to support the use of long-acting injectables for the management of schizophrenia in children. However, they may be considered in case there is history of nonadherence.[1,4] Positive symptoms have a good response to antipsychotics. Negative symptoms respond poorly. Cognitive symptoms have not been evaluated in children.[4]

Extra-pyramidal symptoms (EPS) can take the form of drug-induced Parkinsonism, neuroleptic malignant syndrome (NMS), dystonia, and akathisia. FGAs and high-potency SGAs produce more EPS. Acute EPS occurs in days to weeks. For Parkinsonism, the first step is to decrease the dose. If no improvement occurs with this, switch to some other antipsychotic. But if the drug cannot be changed, an anticholinergic agent can be added. In the case of acute dystonia, parenteral anticholinergic is given (promethazine). For severe akathisia, benzodiazepine or β-blocker can be added. When NMS develops, all antipsychotics should be stopped, and supportive management should be given. Antipsychotics can also cause hyperprolactinemia, more often due to FGAs. The first step is to decrease the dose and watch. If that is not possible, add bromocriptine or amantadine or aripiprazole.[4]

Monitor weight, lipid profile, and fasting blood sugar periodically for metabolic side effects. In case of a gain of 7% weight, the emergence of hyperlipidemia, hypertension, or hyperglycemia, the antipsychotic needs to be changed. If change is not possible, adding metformin or topiramate is to be considered. QTc prolongation may occur with high doses of haloperidol and quetiapine.[4] Adjunctive medicines such as mood stabilizers for manic symptoms and antidepressants for depression may be required.[1]

Treatment-resistant Schizophrenia

Clozapine is indicated for children who do not respond to a trial of two antipsychotics, each given for at least 6–8 weeks in adequate doses. Up to 50% of children may be treatment-resistant.[5,7] Clozapine is documented to be effective in improving positive symptoms of COS, as reported in data from Northern India. It did not produce any serious side effects in children with COS according to the same report.[17] According to most guidelines, weekly monitoring of absolute neutrophil count should be done for at least 6 months after starting clozapine.[1] However, recently, the FDA removed the mandatory requirement of weekly monitoring of neutrophil counts for clozapine administration as the benefits of clozapine far outweigh the risks. Weekly monitoring was cumbersome and many patients were deprived of its benefits.[18] Monitoring of metabolic parameters should be done once every 3 months.[1]

Electroconvulsive therapy (ECT) in adults is recommended for catatonia, refusal to eat, suicidality, affective symptoms, violence, rapid control of symptoms, good response in the past, and treatment resistance. For similar reasons, ECT can be considered in children. Mental Health Care Act (MHCA) 2017 prohibited the routine use of ECT for children. It can still be done after obtaining prior permission from Mental Health Review Boards (MHRB) and parental consent.[4]

Psychotherapeutic Interventions

Cognitive behavior therapy, family therapy, cognitive remediation, and social skills training have been found helpful in adults with schizophrenia. They are done with the goals of symptom reduction, improving social occupational functioning, and decreasing the risk of relapse. These interventions can be tried in children with similar goals.[1]

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SUMMARY AND CONCLUSION

Early onset schizophrenia and COS present unique diagnostic and management challenges due to developmental complexities and the need to differentiate them from other conditions.

Early onset schizophrenia accounts for about 25% of cases of schizophrenia. It has some distinct features from adult-onset schizophrenia. Hallucinations are more common, while delusions are less so. There may be a history of minor deficits in premorbid language and cognitive development. EOS carries a relatively poorer prognosis. The diagnostic criteria for EOS are the same as those for adults. However, it is challenging to diagnose schizophrenia in children due to the complexities of developmental age. EOS has to be differentiated from autism spectrum disorders, mood disorders, and psychotic manifestations due to medical/surgical illnesses.

Despite the similarities in symptoms with adult-onset schizophrenia, children with EOS often have a poorer prognosis and require long-term antipsychotic treatment with careful dosing to manage adverse effects. Identifying high-risk individuals during the prodromal phase and employing psychotherapeutic interventions can improve outcomes. Comprehensive diagnostic assessments and tailored management strategies are essential for effectively treating schizophrenia in children and adolescents. Management of psychotic disorders in children goes in line with management of adults. Children and adolescents with EOS require life-long antipsychotic administration. Doses of antipsychotics are chosen carefully due to sensitivity to adverse effects.

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