

# A SYSTEMATIC OVERVIEW OF PAEDIATRIC SCHIZOPHRENIA

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## ABSTRACT:

Childhood-onset schizophrenia or Paediatric Schizophrenia usually represents a more severe form of the disorder, with more prominent pre-psychotic developmental disorders, structural brain abnormalities, and genetic risk factors. Contemporary practices of schizophrenia treatment are multidisciplinary, recuperation oriented, and consist of medications, with psychosocial interventions. The present paper provides an overview on signs and symptoms, epidemiology, pathogenesis, treatment, comorbidities associated with Childhood-onset schizophrenia

**Keywords:** Childhood-onset schizophrenia, Diagnosis, Treatment

## INTRODUCTION:

Childhood schizophrenia (also known as childhood-onset schizophrenia, and very early-onset schizophrenia) or Paediatric Schizophrenia is quite rare serious psychiatric illness similar in characteristics of schizophrenia that develops at a later age, but has an onset before the age of 13 years, and is more difficult to diagnose. Schizophrenia is a mental disorder categorized by continuous or relapsing episodes of psychosis characterized by positive symptoms that can include hallucinations, delusions, and disorganized speech; negative symptoms, such as blunted affect and avolition and apathy, and a number of cognitive impairments. [1]

## EPIDEMIOLOGY:

Childhood-onset schizophrenia, characterized by onset before age 13 years, has a prevalence of approximately 1 in 40,000. This is a severe form of the illness with gradual onset and poor outcome. The psychotic symptoms that are the hallmark of schizophrenia are present in many alternative diagnoses. The incidence of schizophrenia rises dramatically in adolescence, and its prevalence is estimated at 0.23% in the age between 13 and 18 years.

Boys are twice as likely to be diagnosed with childhood schizophrenia. There is often a disproportionately large number of males with childhood schizophrenia, because the age of onset of the

disorder is earlier in males than females by about 5 years. Clinicians have been and still are reluctant to diagnose schizophrenia early on, primarily due to the stigma attached to it.[2]

### **SIGNS AND SYMPTOMS:**

Childhood-onset schizophrenia, like schizophrenia among adults, involves a combination of both positive and negative symptoms. Positive symptoms, such as hallucinations and delusions, are usually easy to identify. Negative symptoms may be harder to assess. Negative symptoms include apathy, avolition, alogia, anhedonia, asociality, and blunted emotional affect.

Some children with schizophrenia present with cognitive deficits in the areas of memory and executive functioning. It is common to see children with schizophrenia experience academic difficulties, isolation, social withdrawal, disruptive behaviors, and problems with speech and language. The onset of childhood-onset schizophrenia is often insidious, and children frequently have premorbid social and occupational dysfunction prior to developing overt psychotic symptoms.

Childhood-onset schizophrenia frequently presents with a prodrome phase prior to the onset of florid psychotic symptoms. This prodrome phase is characterized by functional decline that affects multiple domains of daily living, including academics, social functioning, and self-care. Associated comorbid psychiatric disorders may further complicate the differentiation of prodromal onset. The prodromal phase is followed by the acute phase, which is usually easier to identify because of the presentation of positive psychotic symptoms and continued decline in functioning. In the recovery phase, which usually occurs in adulthood, patients continue to be impaired, may present primarily with negative symptoms, and may continue positive symptoms. The residual phase, however, is characterized by a complete resolution of positive symptoms for an extended period. Insidious onset of symptoms, onset at a young age, lower intellectual functioning, lower premorbid functioning, and higher rates of negative symptoms are poor prognostic indicators. Individuals experiencing these symptoms, when followed into adulthood and compared with their peers, have been found to have higher unemployment rates and greater social deficits, and they are less likely to live independently. Monitoring for safety is equally important, with studies indicating that about 5% of patients with childhood-onset schizophrenia lose their life to suicide or as a direct result of dangerous behaviors when psychotic. [3]

### **PATHOGENESIS:**

No definite single etiology of schizophrenia has been identified. Most theories accept both genetic and environmental contributions for the causation of childhood-onset schizophrenia.

**Environmental Factors:** Prenatal rubella or influenza infections are associated with childhood-onset schizophrenia. Severity or frequency of prenatal infections may also contribute to earlier onset of symptoms by means of congenital brain malformations, reduction or impairment of cognitive function, and psychological disorders. It is believed that prenatal exposure to rubella modifies the developmental course during childhood, increasing the risk for childhood schizophrenia. Genetic predisposition is an important factor as well; familial mental illness is more frequently reported for childhood-onset schizophrenic patients. While it is hard to detect, there are relatives who are more-likely to be diagnosed with schizophrenia if they are children of individuals who have this disorder. "First degree relatives" are found to have the highest chance of being diagnosed with schizophrenia. Children of individuals with schizophrenia have a 8.2% chance of having schizophrenia while the general population is at an 0.86% chance of having this disorder. These results indicate that genes play a big role in one developing schizophrenia. [4]

**Genetic Factors:** There is "considerable overlap" in the genetics of childhood-onset and adult-onset schizophrenia, but in childhood-onset schizophrenia there is a higher number of "rare allelic variants". There have been several genes indicated in children diagnosed with schizophrenia that include: neuregulin, dysbindin, D-amino acid oxidase, proline dehydrogenase, catechol-O-methyltransferase, and regulator of G protein signalling. There have also been findings of 5HT2A and dopamine D3 receptor. An important gene for adolescent-onset schizophrenia is the catechol-O-methyltransferase gene, a gene that regulates dopamine. Children with schizophrenia have an increase in genetic deletions or duplication mutations] and some have a specific mutation called 22q11 deletion syndrome, which accounts for up to 2% of cases. [5]

**Neuroanatomical Factors:** Neuroimaging studies have found differences between the medicated brains of individuals with schizophrenia and neurotypical brains, though research does not know the cause of the difference. In childhood-onset schizophrenia, there appears to be a more rapid loss of cerebral grey matter during adolescence. Studies have reported that adverse childhood experiences (ACEs) are the most preventable cause of the development of psychiatric disorders such as schizophrenia. ACEs have the potential to impact on the structure and function of the brain; structural changes revealed have been related to stress. Findings also report that different areas of the brain are affected by different types of maltreatment.

#### **DIAGNOSIS:**

The diagnosis of childhood onset schizophrenia is a difficult, time-consuming process. Although early developmental abnormalities in social, motor, and language domains in COS are more striking compared

to the later onset cases. DSM-5 diagnostic criteria for schizophrenia requires at least two of the following five symptoms to be present for a month. At least one of these must be (1), (2), or (3):

1. Delusions
2. Hallucinations
3. Disorganized speech
4. Grossly disorganized or catatonic behavior
5. Negative symptoms

Other criteria include a markedly lower level of functioning in one or more major areas, such as work or school, interpersonal relations or self-care; persistence of continuous signs of disturbance for at least 6 months; the ruling out of schizoaffective disorder; and the exclusion of substance abuse or another medical condition that may be causing the disturbance.

In patients with a history of autism spectrum disorder or a communication disorder of childhood onset, the additional diagnosis of schizophrenia is made only if prominent delusions or hallucinations, in addition to the other required symptoms or schizophrenia are also present for at least 1 month (or less if successfully treated).

In addition to the five symptom domain areas identified in the diagnostic criteria, the assessment of cognition, depression, and mania symptom domains is vital for making critically important distinctions between schizophrenia and other psychotic disorders. The American Psychiatric Association removed schizophrenia subtypes from the DSM-5 because they didn't appear to help with providing better targeted treatment, or predicting treatment response. However, those individuals meeting the criteria for catatonia would receive an additional diagnosis of catatonia associated with schizophrenia to indicate the presence of the comorbidity.

The following duration specifiers are used only after 1-year duration of the disorder and they are not in contradiction to the diagnostic course criteria:

- First episode, currently in acute episode
- First episode, currently in partial remission
- First episode, currently in full remission
- Multiple episodes, currently in acute episode
- Multiple episodes, currently in partial remission
- Multiple episodes, currently in full remission
- Continuous

The validity of a diagnosis of childhood-onset schizophrenia has been a point of concern for some, due to difficulty in differentiating pediatric patients' reports of visual hallucinations from imaginary figures (which may be developmentally normal). [6]

#### **TREATMENT:**

Pharmacotherapy is essential in the treatment of individuals with childhood-onset psychosis. Electroconvulsive therapy has also been used adjunctively in rare cases.

**Pharmacotherapy:** The first-line agents are neuroleptics. Newer atypical antipsychotic agents are generally chosen as the initial medications of choice. Many second-generation antipsychotics have been approved by the FDA in recent years for adolescents to treat schizophrenia including aripiprazole, lurasidone, olanzapine, quetiapine, paliperidone, and risperidone.

**Diet:** Typical and atypical antipsychotic medications may stimulate the appetite. Low-calorie snacks and limitation of total intake at meals may help prevent excess weight gain. Weight and body mass index should be monitored in all patients on atypical antipsychotics.

**Psychosocial Management:** The child with schizophrenia requires multimodal care. This should include social skills training, a supportive environment, and a structured individualized special education program. A history of involvement with early education programs has been associated with greater response not only to social interventions but also to antipsychotics. Supportive psychotherapy is used to encourage reality testing and to help the child monitor for warning symptoms of impending relapse. Cognitive behavioral therapy has been used successfully in adults with schizophrenia and may help improve coping with schizophrenia and monitoring of beliefs and attributions. Cognitive remediation therapy in addition to treatment-as-usual in patients with early-onset schizophrenia was found to significantly improve verbal memory, executive function, daily living and adaptive functioning, and improvements in family burden. [7]

#### **COMORBIDITIES:**

Childhood-onset schizophrenia is highly correlated with other illness and disorders. During the evaluation of a child with suspected Childhood schizophrenia, it is imperative they are screened, with a high index of suspicion, for other comorbid illnesses and disorders, both psychiatric and medical, the latter of which account for almost 60% of premature deaths not related to suicide in adult schizophrenia patients. The Psychiatric Comorbidities that should be taken into account includes Obsessive–compulsive Disorder, Attention Deficit Hyperactivity Disorder, Expressive Language Disorders, Receptive Language Disorders, Auditory Processing Deficits, Executive Functioning Deficits and Mood disorder primarily MDD. The Medical Comorbidities associated with treatment include Diabetes, Hyperlipidaemia, Cardiovascular diseases, Obesity, Hyperprolactinaemia and Dyskinesia. [8]

## **PROGNOSIS:**

The prognosis for childhood-onset schizophrenia and adolescent-onset schizophrenia is worse than that observed in adult-onset schizophrenia. A very-early diagnosis of schizophrenia leads to a worse prognosis than other psychotic disorders. The primary area that children with schizophrenia must adapt to is their social surroundings. It has been found, however, that very early-onset schizophrenia carried a more severe prognosis than later-onset schizophrenia. Regardless of treatment, children diagnosed with schizophrenia at an early age have diminished social skills, such as educational and vocational abilities. In follow-up studies, more than 50% of children with schizophrenia have persistent severe impairment in social skills and limitations in academic and occupational achievement. Patients diagnosed with early-onset schizophrenia spectrum disorder were more likely to display violence before 15 years old, and “present early conduct problems.” Other complications arise from poor self-care, impulsivity leading to injury or sexually acquired diseases, and substance abuse. One study found early-onset psychosis (not just schizophrenia) was associated with more agitation and aggression, lifetime substance use disorder, antisocial personality disorder, and interaction with the legal system. The grey matter in the cerebral cortex of the brain shrinks over time in people with schizophrenia [9, 10]

## **PATIENT EDUCATION:**

- Psychoeducation is essential for families of children with schizophrenia. They need to be educated about the causes, symptoms, natural history, therapy, adverse effects of medication, and complications of childhood-onset schizophrenia.
- Families must also know the warning signs of impending relapse. High levels of expressed emotion have been associated with an increased risk of relapse in adults with schizophrenia and can possibly contribute to problems in children with schizophrenia.
- Once children with schizophrenia are in remission, teach them to self-monitor for signs of possible relapse. Inform these children about possible adverse effects of medication.

## **CONCLUSION:**

Childhood-Onset Schizophrenia is an exceptionally intriguing sickness with a rate under 0.04%. In most cases, aggressive medication treatment with Clozapine, along with family education and individual counselling, may prevent further deterioration once a diagnosis is confirmed.

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