Phenomenology and Epidemiology of Childhood Psychiatric Disorders That May Necessitate Treatment With Atypical Antipsychotics

Melissa DelBello, M.D., and Stephen Grcevich, M.D.

Children and adolescents commonly present to clinical settings with more severe psychopathology than previously recognized. Physicians evaluating children may be confronted with clinical manifestations of early-onset schizophrenia, including command hallucinations and delusional thinking, severe irritability and suicidality associated with juvenile-onset bipolar disorder, or the severe aggression of a child with a pervasive developmental disorder. In these as well as other clinical situations, the potential risks and benefits of treatment with atypical antipsychotics should be considered. In this article, we summarize the clinical manifestations of psychiatric disorders in children and adolescents, with particular attention to the disorders for which the benefits of prescribing an atypical antipsychotic may outweigh the potential risks. We also describe the differences in the clinical presentation of these disorders between youth and adults. *(J Clin Psychiatry 2004;65[suppl 6]:12–19)*

Many of the psychiatric disorders observed in adults have their onset in childhood or adolescence. In some instances, the manifestation of specific symptoms of psychiatric disorders in childhood may be different than that in adulthood. The presence of a major mental illness is certainly no less serious in children than in adults. In fact, childhood onset of several of the psychiatric disorders predicts a worse illness course. Early manifestations of mental illness may substantially impact the child's academic performance and achievement and the ability to develop age-appropriate social skills, function as a family member, and participate in normative activities within the community. Thus, appropriate identification and treatment of signs and symptoms of psychiatric illnesses during childhood and adolescence is critical for providing the developmental foundation that may lead to more effective functioning throughout adolescence and into adulthood.

From the University of Cincinnati College of Medicine, Cincinnati, Ohio (Dr. DelBello) and the Department of Psychiatry, Case Western Reserve University School of Medicine, Cleveland, Ohio (Dr. Grcevich).

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Corresponding author and reprints: Melissa DelBello, M.D., Bipolar and Psychotic Disorders Research Program, Department of Psychiatry, University of Cincinnati College of Medicine, 231 Bethesda Avenue, Cincinnati, OH 45267-0559 (e-mail: delbelmp@email.uc.edu).

This review provides an overview of common childhood psychiatric disorders for which use of atypical antipsychotics may be considered, including psychotic disorders, mood disorders, pervasive developmental disorders (PDDs), disruptive behavior disorders, tic disorders, and anorexia nervosa. For each of these disorders, the epidemiology and clinical features are described, with a focus on the specific target symptoms that may lead to consideration of pharmacotherapy with atypical antipsychotics. At this time, no atypical antipsychotic has been approved by the U.S. Food and Drug Administration for use in children or adolescents.

SCHIZOPHRENIA

Childhood-onset schizophrenia is related to greater disease severity than is adult onset.[1] Childhood-onset schizophrenia is often characterized as a neurodevelopmental disorder and is associated with abnormalities in cognition, neuroanatomy, and social functioning.[2–5] Although limited prevalence data exist, it is estimated that 1 in 10,000 children develop schizophrenia.[2,6] The onset of schizophrenia is rare before age 13 years, but the incidence steadily increases during adolescence.[2] The peak age at onset for schizophrenia is 15 to 30 years; however, children as young as 3 years have been diagnosed with the disorder.[2,7] The American Academy of Child and Adolescent Psychiatry uses the term *very-early-onset schizophrenia* to describe schizophrenia that occurs before puberty (i.e., before age 12 or 13 years).[2] Very-early-onset schizophrenia was formerly referred to as *prepubertal schizophrenia*; however, this terminology was thought to be misleading because

puberty can begin before age 12 years.[8] Schizophrenia occurring before age 18 years is referred to as early-onset schizophrenia (EOS).[2] Early-onset schizophrenia, especially very-early-onset schizophrenia, tends to be more predominant in boys than in girls, with a ratio of approximately 2 to 1.[2] This predominance in boys appears to be a function of the earlier age at onset associated with schizophrenia in males as opposed to females. As age increases, however, there is no sex difference in rate of schizophrenia.[7]

The etiology of schizophrenia in children is unclear; however, a number of neuroanatomical and neurobiological factors have been found in patients with schizophrenia. The occurrence of adult schizophrenia has been associated with alterations in brain structure and size, perinatal complications, minor physical anomalies, and disruption of fetal neural development during the second trimester of pregnancy.[9] The most consistent findings from neuroimaging studies of childhood-onset schizophrenia are of ventricular enlargement of the brain and reduced total brain volume. Longitudinal studies have shown that patients with EOS have evidence of progressive ventricular enlargement.[8,10] Siblings of patients with EOS also have significantly smaller total cerebral volume and total frontal and parietal gray matter volumes than do volunteers, suggesting that these abnormalities may be genetic trait markers.[11] Other studies show that there are measurable differences in glucose metabolism, irregular autonomic nervous system arousal, and problems with visual tracking of moving objects in children with schizophrenia.[7] Twin studies also indicate a possible genetic link.[12]

Classic schizophrenia is associated with positive and negative symptoms. Positive symptoms refer to hallucinations, delusions, and thought disorder; negative symptoms refer to deficits such as flat affect, anergy, and little speech or thought. In addition to positive and negative symptoms, disorganized behavior, such as disorganized speech, bizarre behavior, and poor attention, may be present. In EOS, hallucinations, thought disorder, and flattened affect are common.[2] Additionally, children with schizophrenia show 3 characteristic communication deficits: loose associations, illogical thinking, and impaired discourse skills.[2] The diagnosis of schizophrenia is made when the disturbance is present for at least 6 months on the basis of DSM-IV criteria.[13]

In children, schizophrenia generally has an insidious onset, with a clinical course that tends to be unremitting and chronic.[2,8] The majority of children with EOS have some type of premorbid abnormality, such as social withdrawal and isolation, speech and language problems, academic difficulties, or developmental delays.[2,7,14] Results of a study conducted by Schaeffer and Ross[15] indicate that children with schizophrenia go through a premorbid and prodromal phase. The premorbid phase consists of a preschool period in which there are nonspecific concerns that something is wrong and an early school-age period characterized by nonspecific impairments in attention and behavior. During this early school-age phase, a child may experience behavioral problems and developmental delays, especially in language and motor skills. In addition, there are often difficulties in developing normal interpersonal relationships and problem-solving skills.[7] The premorbid phase is followed by a prodromal phase that results in the development of psychosis.[15] In contrast to the onset of psychosis in adolescents or adults, psychosis usually develops gradually in children, without any abrupt onset or sudden break.[16] In most cases, the best predictor of outcome appears to be premorbid function. In general, most children diagnosed with schizophrenia maintain their diagnosis, and functional outcome is poor, with almost half exhibiting a deteriorating course or minimal improvement.[17,18]

BIPOLAR DISORDERS

A child who has at least 1 manic episode is classified as having bipolar disorder type I. A child who has had 1 or more episodes of major depressive disorder and at least 1 episode of hypomania is classified according to DSM-IV criteria as having bipolar disorder type II.[13] Cyclothymia is a disorder of at least 1-year duration during which there are periods of hypomanic and depressive symptoms that do not meet criteria for a manic or major depressive episode. Bipolar disorder not otherwise specified is frequently used as a diagnostic category in children and adolescents because their mood episodes often do not meet full DSM-IV criteria for duration of symptoms.

Bipolar disorder may present differently in children and adolescents than in adults. Children and adolescents commonly present with irritability, ultrarapid cycling, and mixed manic states.[19] Disruptive behavior disorder and attention-deficit/hyperactivity disorder (ADHD) are commonly comorbid in children and adolescents with bipolar disorder.

Although the criteria for a manic episode are the same for children, adolescents, and adults, specific symptoms may present differently in different age groups. For example, children may be much happier than their situation warrants, with parental reports of inappropriate "goofiness" or silliness. Children with irritability may have prolonged temper tantrums, or an adolescent may appear extremely oppositional or belligerent; therefore, these youths may be misdiagnosed with oppositional defiant disorder (ODD) or conduct disorder. Children or adolescents who present with grandiosity may think they "can teach the class better than any of the teachers," despite failing in school. Abnormal grandiose ideation is out of context for the situation and the developmental level of the child or adolescent. The child may become hypersexual and inappropriately touch dolls, peers, or adults in an attempt to engage them in "sex." Adolescents may display promiscuous sexual behavior or have binges of drinking, drug use,

or shopping.[20] However, although hypersexuality may be present in almost half of youth with bipolar disorder, rates of sexual abuse are < 1%.[21]

In a large-scale epidemiologic study, Lewinsohn et al.[22] reported the lifetime prevalence of bipolar disorders (primarily bipolar disorder type II and cyclothymia) to be 1%. Data from retrospective studies suggest that the age at onset may be as young as 5 years.[23] Twin studies indicate that bipolar disorder has a high rate of heritability, with concordance of 50% to 70% in monozygotic twins compared with 13% to 30% in dizygotic twins.[24,25]

High rates of suicide and substance abuse are also present in adolescents with bipolar disorder.[26–28] Other common comorbid conditions occurring in children with bipolar disorder include ADHD and conduct disorder.[20,27,29] In samples of prepubescent patients with bipolar disorder, almost 100% have concurrent ADHD. In adolescent bipolar disorder samples, however, rates of comorbidity of bipolar disorder and ADHD are 30% to 50%. Explanations for this high level of comorbidity include pediatric bipolar disorder with ADHD as a distinct form of early-onset bipolar disorder, ADHD as a prodrome of juvenile mania, or simply misclassification due to symptom overlap between the 2 conditions.[30]

The clinical course of bipolar disorder in youths is unclear. A 5- to 10-year lag may exist between the onset of symptoms and recognition that treatment is warranted.[31] Although outcome studies differ in their definition of recovery, most studies have found that patients with early-onset bipolar disorder have a more severe illness course.[32–34] Several small prospective studies, however, have reported favorable outcomes in adolescents with bipolar disorder.[35–38]

DEVELOPMENTAL DISORDERS

Pervasive developmental disorders are a group of neurodevelopmental disorders that usually affect children before age 5 years. Pervasive developmental disorders include 5 distinct disorders: autistic disorder, Rett's disorder, childhood disintegrative disorder, Asperger's disorder, and PDD not otherwise specified. Of these 5 disorders, autistic disorder is considered the prototype of PDD.[39]

Autistic Disorder

Autistic spectrum disorder is characterized by a triad of impairments in socialization, communication, and restricted, repetitive, inflexible behavior.[40] To meet the criteria for autistic disorder, impairments must be present before age 3 years.[13] The prevalence of autism has increased markedly from 2 to 4 per 10,000 children in the early 1970s to 1 to 2 per 1000 children in the late 1990s.[41,42] Possible explanations for the increased prevalence rates of autistic disorders are better recognition of the disorder and broadening of diagnostic criteria. Autistic disorder is more prevalent in boys, with a sex ratio between 3 to 1 and 4 to 1.[42] Although the exact etiology of autistic disorder is unknown, twin studies suggest a genetic basis.[40,41] In monozygotic twins, concordance for autism was > 36% but < 100%. Concordance of autism in dizygotic twins ranged from 0% to 24%.[41,43] Although vaccinations and various immune system abnormalities have been proposed to have a role in the development of autistic disorder, there is insufficient evidence to support such causes.[44] The central nervous system in children with autistic disorder has been shown to be altered in several regions in the brain, specifically the medial prefrontal cortex and the amygdala.[40,45]

During early adolescence, up to 30% of children with autistic disorder develop epilepsy.[42] Other comorbid conditions commonly affecting children with severe autistic disorder include blindness, deafness, tuberous sclerosis, and neurofibromatosis. Compared with the general population, individuals with autistic disorder have a reduced life expectancy. Common causes of death in these patients are seizures, nervous system dysfunction, or suffocation.[42]

Rett's Disorder

Rett's disorder occurs almost exclusively in girls, with a prevalence rate of approximately 1 in 10,000 to 15,000.[39,46] The disorder is characterized by a period of normal development followed by deceleration of head growth around age 5 months to 4 years. The loss of hand skills and the appearance of stereotypic hand-wringing movements follow. At age 2 to 3 years, there is deterioration in social skills and expressive and receptive language. The child's gait becomes broad-based and jerky, and ataxia and apraxia become prominent. In addition, breathing dysfunctions may become severe.[13,39] Rett's disorder is due to genetic causes, with a 100% concordance in monozygotic twins and 100% discordance in dizygotic twins.[39] One third of cases are believed to be from a mutation in a gene called MeCP2,[39,47] which is thought to have a role in the epigenetic regulation of gene expression. Clinical outcome is generally poor, with a reported annual mortality rate of 1.2%. The incidence of sudden and unexpected deaths is approximately 26%.[48]

Childhood Disintegrative Disorder

Childhood disintegrative disorder is less prevalent than autism. It is characterized by a marked regression in social, communicative, and adaptive skills despite normal development in these areas during the first 2 to 4 years of life.[13,39] The median age at onset of childhood disintegrative disorder is approximately 36 months (range, 24–70 months), and there is no difference in rates of occurrence on the basis of sex.[39,49] Compared with children with autism, children with childhood disintegrative disorder are more likely to be mute and to have lower IQ scores (< 40).[49]

Asperger's Disorder

Asperger's disorder is characterized by difficulties in social interaction and restricted patterns of behavior and

interest. Unlike a child with autistic disorder, however, a child with Asperger's disorder has no general delay in language.[13,40]

Pervasive Developmental Disorder Not Otherwise Specified

Pervasive developmental disorder not otherwise specified is similar to autistic disorder; however, the child does not meet DSM-IV criteria for autism because of atypical symptoms, late onset, and nonsevere symptoms.[13,40]

Children with PDDs who present for ongoing medical management may benefit from treatment to address specific target symptoms associated with these disorders. Common clinical concerns include aggressive behavior directed at self, family members, peers, teachers, and other authority figures; self-injurious or stereotypic behavior; problems with inattention or disinhibition; and comorbid mood or anxiety symptoms. Careful consideration of the clinical risks and benefits of pharmacotherapy is of particular importance in this population, given that many of these patients are unable to communicate to caregivers the presence of medication adverse effects.

DISRUPTIVE BEHAVIOR DISORDERS

The disruptive behavior disorders consist of 2 disorders: ODD and conduct disorder. Oppositional defiant disorder is characterized by a pattern of persistent negativistic, irritable, and noncompliant behavior.[50] Conduct disorder is characterized by a repetitive and persistent pattern of violating rules and rights of others.[50] Conduct disorder is one of the most common reasons for psychiatric evaluation in children and adolescents.[51,52]

In a cross-sectional study, Bird et al.[53] reported the prevalence of conduct disorder and ODD to be 5.8% and 7.0%, respectively, in a multiethnic group of 1210 children aged 9 to 17 years. Disruptive behavior disorders are more prevalent in boys (sex ratio of 5 to 1).[51] The prevalence of these disorders, however, may be underestimated in girls.[54] Although psychosocial factors, such as family environment and parenting, are considered to contribute to, or at least be associated with, the development of conduct disorder or ODD, these factors alone do not fully explain the etiology of these disorders.[54] Psychobiological factors may also be involved and are being actively researched.[51,54] In a study conducted by Wakschlag et al.,[52] the odds of developing severe antisocial behavior were approximately 1.5 to 4 times greater for youths exposed to prenatal smoking than in youths not exposed, indicating that prenatal smoking may have a possible etiologic role in the onset of antisocial behavior.

Symptoms of ODD are usually recognizable by school age and include frequent loss of temper and defiance as well as a tendency to be argumentative, to be easily annoyed by others, and to deliberately annoy others.[13,50] Oppositional defiant disorder differs from conduct disorder in that aggression and theft are usually absent. Oppositional defiant disorder that is prodromal to conduct disorder predicts more severe disease and puts the child at increased risk for additional psychiatric disorders.[54]

Conduct disorder is considered a precursor to adult antisocial personality disorder.[54] The clinical course of conduct disorder can follow one of 2 developmental pathways.[51,54] The first and more severe of the 2 pathways is the life-course persistent pathway. This pathway has an early onset and involves active and diverse delinquency that increases in seriousness and continues into adulthood. Children with this type of conduct disorder typically have impairments in reading, language, and motor development and show signs of impulsivity, aggressiveness, and hyperactivity by age 5 years.[54] Delinquent behavior and violent crimes often begin at an early age in these children. By adulthood, these children often suffer from serious psychiatric illnesses.

The second pathway is the adolescent-onset pathway. In this pathway, children may lack or have a limited history of preadolescent conduct problems. Although they display antisocial behavior, they tend to be less violent. In contrast to the life-course persistent pathway, only about 25% of adolescents with this late-onset form of conduct disorder continue their delinquent behavior into adulthood.[51,54]

Children and adolescents who present for treatment of disruptive behavior disorders frequently receive treatment specific for symptoms of inattention, disinhibition, and hyperactivity related to ADHD, which often occurs as a comorbid condition with conduct disorder and ODD. Patients without comorbid ADHD may receive pharmacotherapy in an attempt to attenuate impulsive, aggressive, or violent behavior that may be associated with conduct disorder or ODD.

TIC DISORDERS

The DSM-IV defines tics as sudden, rapid, recurrent, nonrhythmic, stereotyped motor movements or vocalizations.[13] There are 4 tic disorders classified by the DSM-IV: chronic motor or vocal tic disorder, transient tic disorder, Tourette's disorder, and tic disorder not otherwise specified (Table 1).

In a summary of 10 studies that estimated the prevalence of tic disorders in children and adolescents, transient tics were estimated to affect 12% of school-aged children, and chronic tics were estimated to affect 2% to 5% of school-aged children. Additionally, the prevalence of Tourette's disorder was estimated at 10 to 30 cases per 10,000 children.[55] The same study also found that the risk of Tourette's disorder and chronic tic disorder is greater in boys than in girls.

With the exception of tic disorder not otherwise specified, the age at onset of tic disorders must be before 18 years.[13] Tourette's disorder typically begins in children aged

Table 1. Classification of Tic Disorders[a]

Tic Disorder	Characteristics	Examples
Chronic motor disorder[b]		
Simple	Movement of 1 muscle group	Eye blinking or head turning
Complex	Coordinated movements	Hand gestures or facial contortions
Chronic vocal tic disorder[b]		
Simple	Meaningless sounds	Grunting, throat clearing, or sniffing
Complex	Meaningful syllables, words, or phrases	Repeating simple words, phrases, or syllables (palilalia and echolalia) or shouting obscenities without any reason (coprolalia)
Transient tic disorder	Single or multiple motor or vocal tics that occur many times a day, nearly every day for ≥ 4 weeks, but ≤ 12 consecutive months	
Tourette's disorder	Multiple motor tics and ≥ 1 vocal tics that occur many times per day for > 1 year, with a symptom-free interval of < 3 months	
Tic disorder not otherwise specified	Tics that do not meet the criteria for a specific tic disorder	Tics lasting < 4 weeks or onset of tics after age 18 years

[a]Data from the American Psychiatric Association[13] and Evidente.[56]
[b]Present multiple times per day continuously for > 3 months throughout a period of > 1 year.

between 2 and 15 years.[13,56] For motor tics, the median age at onset is approximately 6 to 7 years and tends to precede vocal tics by 1 to 2 years.[13,56] The etiology of tic disorders seems to be multifactorial and involves genetic and environmental factors. Tics may, however, develop secondarily to idiopathic or hereditary disorders such as Huntington's disease, infections, developmental disorders, or drugs.[57] In the case of Tourette's disorder, evidence collected over the past 20 years shows that there is a strong genetic component.[58]

Tic disorders are generally preceded by a premonitory urge or sensation.[13,56,57] This urge builds until the tic behavior occurs, followed by relief once the behavior has been expressed. Although the behavior is considered involuntary, the behavior can be suppressed for brief periods of time. The frequency and severity of tics increase with factors such as stress, excitement, idleness, and caffeine.[59] Engaging in mental or physical activities or using cannabinoid substances, alcohol, or nicotine, however, appear to reduce the frequency of the behavior.[60,61]

In some cases, the repetitive or violent movements may result in self-injury or pain to muscles and joints.[57] For example, severe motor tics can result in falls, fractures, and dislocation of joints. Severe vocal tics may result in impairments in respiration, speech, and swallowing.[56] For most children, tics usually cause social embarrassment and lowered self-esteem, which may impair social, academic, and occupational functioning.[13,56,57]

Of the tic disorders, Tourette's disorder is considered the most severe. Common symptoms of Tourette's disorder often resemble obsessive-compulsive disorder (OCD) (e.g., obsessions, compulsions) and ADHD (e.g., hyperactivity, distractibility, and impulsivity).[13] In fact, OCD is present in 30% to 50% of children with Tourette's disorder, and ADHD is present in approximately 50% of children with the disorder.[56,60] In a community-based epidemiologic study, Kurlan et al.[62] reported that children with a tic disorder had a higher frequency of ADHD than did children without tics (38.4% vs. 19.5%; $p < .0001$). In a pilot study conducted by Stephens and Sandor,[63] children with Tourette's disorder and comorbid ADHD or OCD were at greater risk for developing aggressive behavior than were children with Tourette's disorder alone.

In many cases, symptoms of tic disorder diminish during adolescence and adulthood and may disappear completely by early adulthood.[13] Tics are usually considered permanent if they persist beyond adolescence. Factors predictive of a poorer prognosis in adulthood include perinatal complications, unstable family life, chronic physical illness, comorbid mental and developmental disorders, and substance abuse.[56]

EATING DISORDERS

Eating disorders in children and adolescents are a serious concern because of the morbidity and mortality involved with these conditions. The DSM-IV recognizes 2 main types of eating disorders: anorexia nervosa and bulimia nervosa.[13] Both disorders involve a disturbance in the perception of body shape and weight. In a study evaluating 1103 middle- and high-school girls from Arizona and California, thin body preoccupation and social pressure were significant predictors of the development of eating disorders.[64]

Anorexia Nervosa

Early-onset or childhood anorexia nervosa is defined as attempts to lose weight or avoid gaining weight by restricting food intake, self-inducing vomiting, abusing laxatives, exercising excessively, or a combination of these practices.[65] The prevalence of childhood anorexia nervosa has not been specifically studied[65]; however, the estimated lifetime prevalence of the disorder in the general female population ranges from 0.1% to 1% and may be on the rise.[66] In men, the prevalence of the disorder is estimated to be one

tenth of that in women.[13] As observed in adolescents and adults, childhood anorexia predominantly affects girls more than boys, with an overall sex ratio of 9.5 to 1.[65] Although once believed to affect only white middle- to upper-class females, current studies indicate that there are no socioeconomic differences in prevalence rates of anorexia.[64,67] The cause of anorexia nervosa is unclear but may be related to multiple factors, including social and environmental factors, genetic and psychological predisposition, and biological vulnerability.[68] Studies in twins indicate a genetic link, with concordance rates approximately 10 times greater in monozygotic twins than dizygotic twins.[13,65]

The onset of anorexia nervosa is typically between age 14 and 18 years.[13] Two subtypes of anorexia nervosa are recognized by the DSM-IV: restricting type and binge-eating/purging type. The clinical presentation of anorexia nervosa includes psychological and physical manifestations. Psychological manifestations are a fear of gaining weight or becoming fat, disturbance in the way one's body and shape are perceived or experienced, depressive symptoms (e.g., depressed mood, social withdrawal), and obsessive-compulsive symptoms related or unrelated to food (e.g., preoccupation with thoughts of food, hoarding food).[13,67] Other features that may be present are a strong need to control one's environment, excessive exercising, perfectionism, or fear of eating in public. Physical manifestations consist of amenorrhea, constipation, hypothermia, fatigue, and bradycardia. Other features may include emaciation, lanugo (fine body hair), and dry skin. In individuals inducing vomiting, there may be dental enamel erosion and scars or calluses on their hands.[13] Boys also avoid eating foods that they regard as fattening and exercise excessively, but unlike girls, preoccupation pertains more to muscularity than body weight.[65]

The outcome of anorexia nervosa is highly variable; however, favorable outcome has been reported in one half to two thirds of cases.[13,69,70] Factors predictive of a poor outcome are depressive features,[69] severe obsessive and social interaction problems,[71] and poor family life.[69] In addition, problems with reproduction,[72] osteoporosis,[73,74] continued low body mass index, and major depressive disorder[75] have been associated with a history of anorexia nervosa.

Hospitalization may be needed to address fluid and electrolyte imbalances and restore weight; however, of individuals admitted to university hospitals, >10% of cases resulted in death.[13] Overall, the estimated mortality from anorexia nervosa has been reported at approximately 6% per decade.[76] Common causes of death involve starvation, suicide, and electrolyte imbalance.[13]

Pharmacotherapy in patients with anorexia nervosa may be considered as a method of inducing weight gain in those individuals who have become medically compromised because of starvation related to the disorder, as well as a means to address comorbid psychiatric disorders often observed in this population.

Bulimia Nervosa

Although considered rare in school-aged children, bulimia nervosa is characterized by episodes of binge eating accompanied by a lack of control and followed by compensatory behaviors to avoid weight gain.[13,65] The DSM-IV defines a binge as eating in a discrete period of time (< 2 hours) an amount of food that is definitely larger than most people would eat in a similar period of time and circumstance.[13] Binge eating usually occurs in secrecy and may or may not be planned.

In women, the lifetime prevalence of bulimia nervosa is 1% to 3%.[13,66] Like anorexia nervosa, the prevalence of bulimia nervosa in men is approximately one tenth that seen in women.[13] In an epidemiologic study conducted in Olmstead County, Minn.,[77] the male-to-female sex ratio of bulimia nervosa was 1 to 33, with a peak age at onset of 15 to 19 years. The age at onset for bulimia nervosa is typically late adolescence or early adulthood.[13] The etiology of this disorder is unclear but is most likely multifactorial. The concordance of bulimia nervosa is almost 3 times greater in monozygotic twins than dizygotic twins.[78]

Bulimia nervosa is typically seen in individuals who are of normal weight; however, individuals who are underweight or mildly overweight may be affected. Psychological manifestations are depressive symptoms, which may precede the onset of the disorder in some cases, and an increased frequency of anxiety symptoms or anxiety disorders. In addition to mood and anxiety disorders, other common comorbidities with bulimia nervosa are cluster B and C personality disorders and substance or alcohol use disorders.[67] Dependence or abuse of alcohol or stimulants is reported in at least 30% of individuals with bulimia nervosa.[13] Physical manifestations involve menstrual irregularities, an increase in dental cavities, loss of dental enamel, and calluses or scars over the knuckles of the hand. More serious and life-threatening complications include esophageal tears, gastric rupture, and cardiac arrhythmias. The clinical course may be chronic or intermittent. Remission periods of > 1 year are related to a better long-term outcome.[13]

DISCUSSION

There are few studies of the phenomenology and prevalence of psychiatric disorders in children and adolescents. Most of the currently reported prevalence rates vary largely according to the sample of the population studied and the variability in definition used to identify the disorders. It is believed that many of these disorders are much more common in children than previously recognized. For many of the disorders described, identifiable signs and symptoms may usually be detected in children as early as elementary school.

In general, boys have a higher prevalence of most psychiatric disorders during childhood and adolescence than do girls; however, eating disorders disproportionally affect

girls more than boys.[13] The occurrence of schizophrenia tends to be predominant in boys at a young age, although there may be a shift in incidence toward girls as children age, resulting in a relatively equal sex distribution.[7,79] In the case of disruptive behavior disorder, the focus is usually on boys; however, research is beginning to show that this disorder is underdiagnosed in girls.[54] Indirect aggression, such as manipulative behavior, is predominant in girls at all age levels, and girls with ODD or conduct disorder may become as deviant as boys.[54]

Comorbid conditions are common with many childhood psychiatric disorders. They often complicate the clinical picture and, in some cases, may lead to diagnostic confusion. Patients with eating disorders often have comorbid OCD, major depressive disorder, anxiety, or personality disorders.[13,67] Bipolar disorder and disruptive behavior disorder have overlapping symptoms that, if not properly investigated, can lead to an incorrect diagnosis. Additionally, the presence of a specific psychiatric disorder can predict the occurrence of other disorders later in life; an example of this is tic disorder predicting OCD.[62,80] In some cases, comorbid conditions can put a child at increased risk of harm. This is true for children with autistic disorder, where epilepsy can occur in up to 30% of these individuals and is a common cause of death.[42] Suicide and alcohol or substance abuse during the adolescent years are common problems with disorders such as bipolar disorder and eating disorders.[13,27,67,81]

Psychiatric disorders with an onset in childhood generally predict worse prognoses than do disorders that have a later onset. For example, the presence of ODD, conduct disorder, or bipolar disorder during childhood is usually predictive of a more severe disease course.[32,33,51,54] Tic disorders that persist beyond adolescence are generally considered permanent.[56] Unrecognized eating disorders can substantially impair social and psychological functioning as well as result in serious and potentially life-threatening physical complications.[13,66,67] Appropriately identifying psychiatric disorders early in childhood and adolescence is a critical step in minimizing continued or additional psychiatric problems that put these children at risk later in life.

The challenges that clinicians encounter in treating children and adolescents with psychiatric disorders involve ascertaining symptoms from parents, children and adolescents, and teachers; formulating a differential diagnosis; and developing a treatment plan in which the risks of treatment as well as the risks of withholding treatment are considered.

CONCLUSION

Serious childhood psychiatric disorders are more common than previously recognized. Early identification of children with psychiatric disorders is an essential step in prescribing appropriate and effective therapy and potentially preventing serious and long-term sequelae in adulthood. Clinicians are obligated to maintain awareness of a rapidly evolving literature base to enable them to make the most thoughtful and reasoned treatment recommendations possible.

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