

ADHD and bipolar disorder among adolescents: Diagnostic traps for the unwary.

S. Rozenzweig MD, N. Zdanowicz MD PhD, A. Myslinski MD, Ch. Reynaert MD PhD, D. Jacques MD

Université Catholique de Louvain, University Hospital Center of Mont-Godinne, Psychosomatic Unit, 5530 Yvoir Belgium

Abstract

Since we have effective medication for adolescents with ADHD, it has become important for it to be diagnosed. However, diagnosing ADHD has been complicated by the fact that bipolar disorder may also be present at this age. Although these entities can be distinguished from each other they may also overlap. This paper sets out to review the clinical pictures of both conditions and highlights the conceptual and symptomatic separating lines.

Key words: bipolar disorder, ADHD.

Introduction

In the majority of cases, it is easy to distinguish a child with ADHD from one with a bipolar disorder. However, in certain situations, these disorders may not be so easily differentiated. Hence, when faced with a restless, elated, or even depressed child, both diagnoses are possible. The dividing lines between these two entities are clear in theory but sometimes less so in practice. Such imprecision results chiefly from three causes:

1. Although ADHD is relatively well-known and identified, this does not alter the fact that the rate of prevalence may vary from 1 to 20% from one continent to another, from one country to another, or even from one region to another. There is, as yet, no single or full explanation for this peculiarity. Even though a recent meta-analysis (1) stresses the methodological differences (diagnostic criteria, information sources, exclusion criteria, etc.) as causes of the disparities between Europe and the USA, other studies point to the nosological and cultural differences between practitioners, differences in young people's academic requirements, and so on.
2. It is not new knowledge that bipolar disorder (BPD) may be present in a child or an adolescent but, practically speaking, this possibility is always ruled out in the DSM IV-TR (2). The diagnostic criteria for BPD are thus particularly vague at these ages. Some writers support strict respect of the adult criteria applied to young people; others recognise the same criteria but applied in a less strict fashion; yet others talk about atypical clinical pictures.
3. Epidemiological studies into the co-occurrence of the two diagnoses in the same young person show that double diagnoses are more frequent than a single diagnosis! Whilst one may often observe in psychiatry that one disorder is accompanied by other psychiatric comorbidities, this is never seen with such frequency. For the double diagnosis of ADHD-BPD, the figures most often reported are 85% of ADHD-BPD diagnosed among patients affected by BPD and 22% of BPD identified among children with ADHD (3).

The difficulty in distinguishing the two entities is obviously a major problem when choosing the appropriate treatment. We shall attempt to go back over each of the two entities, both from the standpoint of conceptual as well as diagnostic dividing lines; we shall demonstrate how some symptoms may overlap and lead to errors in diagnosis. Finally, we shall discuss the implications of the high rate of double diagnosis.

Results

Attention Deficit Hyperactivity Disorder

The History of ADHD

Attention Deficit/Hyperactivity Disorder has been known since the Nineteenth Century. In 1845, H. Hoffmann in Germany, and in 1897, Bourneville in France, were the first to describe cases of motor instability, initially amongst children and then in adults. This concept of “neuromotor instability” was later expanded upon by Wallon’s contributions which included it in a broader nosological classification: Children’s Instability Syndrome. In Europe in the fifties, the influence of the psychoanalytic current and psychodynamic approaches grew in psychiatry. This development changed “neuromotor instability” into “affective-emotional” disorders. On the other hand, in the USA, the prevailing focus was on a non-psychological approach and the study of the cortex and mesencephalic regions. Neuro-anatomical observations of restless children gave rise to various publications at the beginning of the Twentieth Century. The work of Still and von Economo resulted in the concept of “Brain Damage Syndrome,” and then hyperkinesia. Subsequently, the work of Bradley and Laufer helped refine the hyperkinetic syndrome, which appeared in DSM II in 1974. Until that time, hyperkinesia was the major diagnostic criterion. In subsequent versions of DSM (III and III R), diagnostic criteria evolved into other dimensions, resulting in a disorder with three characteristics: inattention, hyperactivity and impulsivity. However, in the later version (DSM IV), following longitudinal studies showing the significance of hyperactivity, the disorder became based on two dimensional diagnostic characteristics: attention deficit on the one hand and hyperactivity-impulsivity on the other.

The Symptomatology of ADHD

The prevalence of ADHD ranges from 3% to 5%; the sex ratio is 3 to 5 boys to one girl (4). ADHD is one of the behavioural disorders most frequently diagnosed in children and adolescents. The three principal symptoms of ADHD are hyperactivity (disorganisation and an excessively high level of activity), inattention (difficulty in concentration, distractibility), and impulsive behaviour (little patience). According to the DSM IV classification (2), ADHD is comprised of three subtypes:

- ADHD Predominantly Inattentive Type
- ADHD Predominantly Hyperactive-Impulsive Type
- ADHD Combined Type. The most severe forms of the combined type, is also referred to as “hyperkinetic syndrome” (HKS).

To make a diagnosis, assessments must be carried out in at least two different situations (for example at school and at home) and the symptoms must have been present for at least six months. Although parents are more likely to identify the symptoms of hyperactivity and teachers the attention symptoms, the concordance rate with the criteria set out in the DSM IV, taking information from parents and teachers, is satisfactory. Teachers are more likely to make the diagnosis in primary rather than secondary school. This is because the academic requirements are more standard and because, in secondary school, the academic curriculum of the “more noisy and distracted children” has already been re-orientated.

More clinically speaking, we may hypothesise the presence of the disorder when a young person has difficulty in any of the following.

- Controlling motor activity, especially if it is complex.
- Controlling chattering.
- Utilising internalised language in behavioural self-control.
- Expressing him/herself or organising his/her thoughts.
- Controlling negative emotions.

- Memorising a task.
- Thinking up and applying a strategy, especially if it is sequential.
- Resisting temptation and delaying gratification.

Bipolar disorder in adolescents

The History of Bipolar Disorder

Mania and melancholy have been identified since antiquity. However, the close links which bring them together into one illness were not recognised until the second half of the Nineteenth Century (4). In 1854, Baillarger described a “dual-form insanity” and J-P Falret identified a “circular insanity,” while German writers gave descriptions of periodic mood disorders. In 1899, Kraepelin identified what he called “manic depressive illness,” to which he assigned predispositional (constitutional, hereditary) propensities and a favourable prognosis despite the tendency to relapses. It has long been acknowledged that the illness (manic-depressive psychosis) constitutes but one distinct disorder. However, in the fifties, clinical and family studies suggested the existence of sub-groups with different characteristics of transmission and progression. This led Léonhard (1959), Angst, Perris and Winokur to propose the first sub-divisions based on “polarity”, as follows.

- Bipolar psychoses, characterised by the occurrence of manic crises and melancholic attacks in the same subject.
- Unipolar psychoses, characterised by the recurrence of melancholic attacks.

Subsequently, Dunner and Fieve (1974), identified a sub-group of rapid cycling manic-depressive psychoses, characterised by the occurrence of at least four dysthymic episodes per year.

The symptomatology of bipolar disorder in adolescents

Even though it was acknowledged in DSM II that adolescents may present a bipolar disorder, with the publication of DSM III at the end of the seventies, this diagnosis was no longer recognised, except in adults. Consequently, until the nineties, the disorder became under-diagnosed amongst adolescents. In 1986, Professor Weller highlighted that many adolescents suffering from a bipolar disorder were being erroneously diagnosed with schizoaffective disorder (Weller and Weller, 1986). Between 1994 and 2003, we saw an “epidemic” of bipolar disorder diagnoses in young people. The reason for this “epidemic,” apart from the under diagnosis in previous years, stems undoubtedly from the great variability of diagnostic criteria utilised by the researchers. Indeed, they must have gone beyond the strict framework of the DSM because “officially speaking” this disorder does not require a description different from that of the adult (5). The only observation specific to this cohort which one finds in the DSM is that mixed disorders seem to be more frequent in adolescents and young adults. However, the clinical expression of bipolar disorder in adolescents differs from that in adults on many levels, principally in terms of duration of episodes and mood variations. In adolescents and young adults, we find much more rapid cycling (6), less distinction between episodes and less inter-critical periods with a return to more or less neutral moods.

The clinical picture of a manic or hypomanic phase in adolescents or young adults, mainly displays the following features.

- A “joyful” mood, uncontrollable laughing, a desire to transgress, feelings of invincibility, increased self-confidence.
- Increased talkativeness with hard-to-follow reasoning, and a need to attract attention.
- Decreased need for sleep with persistent high levels of energy throughout the day.
- The need to carry out many activities, and seek pleasure.

During a manic phase, it is not unusual to observe a psychotic dimension, characterised by auditory and visual hallucinations, usually in relation to mood-congruent delusions of grandiosity. After this rather “high” phase, adolescents displaying this clinical picture swiftly find themselves overwhelmed

and their mood may quickly switch from a state of excitation to one of anxiety and distress. A depressive phase may set in very rapidly and is characterised by the following features.

- Irritability, fatigue. Parents describe their child as grumpy, mournful and crotchety.
- Loss of interest, boredom.
- Loss of appetite or bulimia.
- Difficulty concentrating, especially at school.
- Bouts of crying for no apparent reason.
- Feelings of rejection and failure.

In order to diagnose a bipolar disorder in an adolescent, it is important to carry out a full hetero-anamnesis which takes into account the adolescent’s behaviour at school, in interaction with his/her peers, and his/her family’s functioning. Indeed, the family environment influences, and is strongly influenced by, the symptoms of its bipolar adolescent member. A study analysing the functioning of families of bipolar adolescents was able to demonstrate a faster resolution of manic symptoms in adolescents living in families in which conflicts are rare (7).

Comparison of Entities

The main symptoms can often be clearly distinguished. However, some symptoms can overlap between the two entities.

A bipolar disorder in the manic phase is characterised by the following (8, 4).

- Mood elevation.
- Megalomaniac ideas, a flight of ideas, psychotic characteristics or seeking pleasurable activities.

In hyperactive children, these characteristics are not clearly found. The focus is more on dysphoria. It is unusual to observe megalomaniac ideas, a flight of ideas or psychotic characteristics.

However, it can be difficult to differentiate the following.

- Psychomotor agitation in mania from hyperactivity in ADHD.
- Distractibility and irritability in BPD from inattention and excitability in ADHD.
- Sleep disorders may be present in the two entities but tend to be viewed more as concomitants to mood elevation in BPD, whereas they are more persistent in ADHD (9).

A bipolar disorder in the depressive phase is characterised by the following.

- Low mood function, insomnia, anhedonia, abulia.
- Body weight alterations, most frequently following a loss of appetite.
- Fatigue, loss of energy, hypersomnia and suicidal ideations are specific to this kind of mood disorder.

In a child with ADHD, the focus is chiefly on dysphoria, even depression associated to the disorder, without real fatigue, loss of energy or suicidal ideations.

However, it may be difficult to differentiate the following.

- The difficulties in concentration of the depressive syndrome from the inattention of ADHD.
- Some psychomotor agitation may be manifest in the depressive syndrome following, for example, an episode of increased anxiety. This may correspond to what is referred to as hyperactivity in ADHD, although it is more overt and constant in that disorder.

Tables I and II below propose an evaluation of the level of symptom overlap between the two entities.

Table I: comparison of the symptomatology of Bipolar Disorder (BPD) in the manic phase and Attention Deficit/hyperactivity Disorder/Hyperactivity (ADHD) (according to Scheffer, 8).

BPD	ADHD	Level of symptomatic overlap
Motor agitation	Hyperactivity	High
Impulsivity	Impulsivity	High
Distractibility	Inattention	High
Irritability	Excitability	High
Garrulousness	Logorrhoea	Moderate
Exaltation		Low
Delusions of grandeur		Low
Flight of ideas or the sensation of racing thoughts		Low
Decreased need for sleep	Difficulty going to bed	Low
Increase in goal oriented activities		Low
Excessive involvement in pleasurable activities		Low

Table II: comparison of the symptomatology of Bipolar Disorder (BPD) in the depressive phase and Attention Deficit/hyperactivity Disorder (ADHD) (according to Scheffer, 8).

BPD	ADHD	Level of symptomatic overlap
Depressive mood	Dysphoria	High
Insomnia	Difficulty to calm down	High
Irritability	Irritability	High
Diminished aptitude to concentrate	Inattention	High
Psychomotor Agitation	Hyperactivity	Moderate
Disinhibition	Impulsivity	Moderate
Weight loss or gain	Weight loss under stimulating drugs	Moderate (after treatment with stimulating drugs)
Psychomotor retardation		Low
Fatigue or loss of energy		Low
Hypersomnia		Low
Diminished interest or pleasure		Low

BPD and ADHD may also be distinguished by the following.

- Their sex ratio (3 to 5 boys for 1 girl in ADHD and 2 girls for 1 boy in BPD).
- The age of diagnosis (before 7 years old for ADHD and during adolescence or adulthood for BPD).
- The evolution (more episodic for BPD and more constant over time for ADHD).
- The hetero-anamnesis, mainly familial and scholastic, which may be contributory to one or the other of the disorders.
- Prevalence (1% for BPD and 3-5% for ADHD)
- Therapeutic responses to various therapeutic agents.
- Simultaneous use of diagnostic scales (10, 3). The main rating scales are the Young Mania Rating Scale (YMRS) for mania, the Hamilton scale for depression and the ADHD-RS-IV (11) for hyperactivity. Few

studies propose establishing a differential diagnosis using one single scale. For example, the YMRS has been used (12) on the assumption of overstated scoring in mania in relation to hyperactivity. However, this scale is not a diagnostic instrument and its only purpose is to gauge the intensity of symptoms (10, 3).

Discussion

Although, in theory, the entities are very distinct, in day-to-day practice the distinction may be less straightforward. This observation has led researchers to question the links between the two entities. Three possible relationships have been discussed (13, 14).

1. The symptoms of ADHD are prodromal to the development of a bipolar disorder in children or adolescents. Three observations support this hypothesis. First, individuals reporting a BPD earlier in childhood have significantly more ADHD than adolescents reporting a BPD (15). Second, double-diagnosed patients start their BPD earlier as compared with patients with bipolar disorder alone (16). Finally, we find more ADHD in the descendants of bipolar patients (17, 18).

2. BPD and ADHD are two separate disorders but each present common emotional difficulties in childhood and adolescence.

3. Perhaps a BPD-ADHD entity does exist. In retrospective family studies, we observe a greater risk of developing ADHD when a first-degree relative has had the same diagnosis. Bipolar disorder is more frequent when the person has a close relative with BD or BD-ADHD but not ADHD alone (19). These data thus suggest the existence of a particular pattern of a mixed bipolarity and hyperactivity disorder with its own evolution, an earlier onset, predominance in Caucasian males, a specific clinical presentation (more mixed states, irritability as a main feature, more severe manic symptoms with increased psychosocial difficulties), and a continuous rather than cyclical evolution (20), requiring sequential treatment (21).

Conclusion

The relationship between bipolar disorder and ADHD in adolescents raises questions because of clinical similarities between the two conditions. Extensive research is underway in order to rethink the manner in which these two pathologies coexist. The therapeutic challenge is considerable in view of the poor prognosis resulting from this double diagnosis. The research is all the more difficult as the current nosology for bipolar disorder is not adapted to adolescents. It is important to reconceptualise a symptomatological classification (22) focused on the very complicated, complex, and unique period of adolescence.

GP Comment

What have I learned from this paper?

There is a frequent difficulty in assessing a clinical differential diagnosis in adolescents between bipolar disorder and ADHD because of common similarities at that age. This implies a possible way of seeing those two entities in a different manner, as the consequences of a misdiagnosis is crucial to the evolution of the illness due to a different pharmacological approach. It is important to consider that research at this age is very poor due to the lack of adapted nosology of bipolar disorder.

Dr Juan Mendive, Family Physician, Barcelona.

References

1. Polanczyk G, Silva de Lima M, Lessa Horta B, Biederman J, Rohde LA. The worldwide prevalence of ADHD: a systematic review and metaregression analysis. *Am J Psychiatry* 2007; 164 (6) 942-948.

2. American Psychiatric Association. DSM IV-TR Manuel diagnostique et statistique des troubles mentaux. 4ème édition, texte révisé. Washington DC. Masson; 2000.
3. Singh MK, DelBello MP, Kowatch RA, Strakowski SM. Co-occurrence of bipolar and attention-deficit hyperactivity disorders in children. *Bipolar Disord* 2006; 8 (6): 710-720.
4. Lempérière T, Féline A, Adès J, Ardy P. Psychiatrie de l'adulte. 2e édition. 2006. p 299-300.
5. Zdanowicz N, Jacques D, Janne P, Mylisnki A, Messaud C, Tordeur D, Reynaert Ch. Mood disorders in Adolescents: Concepts and Interrogations among Francophone Psychiatrists.
6. Bradfield BC. Bipolar mood disorder in children and adolescents: in search of theoretic, therapeutic and diagnostic clarity. *South African Journal of psychology* 2010; 40 (3): 241-249.
7. Sullivan EA, Judd CM, Axelson DA, Miklowitz DJ. Family functioning and the course of adolescent bipolar disorder. *Behavior therapy* 2012 Dec; 43(4): 837-47. doi: 10.1016/j.beth.2012.04.005. Epub 2012 Apr 24.
8. Scheffer RE. Concurrent ADHD and Bipolar Disorder. *Curr Psychiatry Rep* 2007; 9 (5): 415-419.
9. Faust DS, Walker D, Sand M. Diagnosis and management of childhood bipolar disorder in the primary care setting. *Clin Pediatr* 2006; 45 (9): 801-808.
10. Carlson GA. Mania and ADHD: comorbidity or confusion. *J Affect Disord* 1998; 51 (2): 177-187.
11. Collett BR, Ohan JL, Myers KM. Ten-year review of rating scales V: scales assessing attention-deficit/hyperactivity disorder. *J Am Acad Child Adolesc Psychiatry* 2003; 42 (9): 1015-1037.
12. Fristad MA, Weller RA, Weller EB. The Mania Rating Scale (MRS): further reliability and validity studies with children. *Ann Clin Psychiatry* 1995; 7 (3): 127-132.
13. Biederman J, Faraone S, Mick E, Wozniak J, Chen L, Ouellette C et al. Attention-deficit hyperactivity disorder and juvenile mania: an overlooked comorbidity? *J Am Acad Child Adolesc Psychiatry* 1996; 35 (8): 997-1008.
14. Donfrancesco R, Miano S, Martines F, Ferrante L, Melegari MG, Masi G. Bipolar disorder co-morbidity in children with attention deficit hyperactivity disorder. *Psychiatry research* 2011; 333-337.
15. Perlis RH, Miyahara S, Marangell LB, Wisniewski SR, Ostacher M, DelBello MP et al. Long-term implications of early onset in bipolar disorder: data from the first 1000 participants in the Systemic Treatment Enhancement Program for Bipolar Disorder (STEP-BD). *Biol Psychiatry* 2004; 55 (9): 875-881.
16. Nierenberg AA, Miyahara S, Spencer T, Wisniewski SR, Otto MW, Simon N et al. Clinical and diagnostic implications of lifetime attention-deficit/hyperactivity disorder comorbidity in adults with bipolar disorder: data from the first 1000 STEP-BD participants. *Biol Psychiatry* 2005; 57 (11): 1467-1473.
17. Chang KD, Steiner H, Ketter T. Psychiatric phenomenology of child and adolescent bipolar offspring. *J Am Acad Child Adolesc Psychiatry* 2000; 39 (4): 453-460.
18. Singh MK, DelBello MP, Soutullo CA. Obstetrical complications in children at high risk for bipolar disorder. *J Psychiatr Research* 2007 Oct; 41(8): 680-5. Epub 2006 May 15.
19. Faraone SV, Biederman J, Mennin D, Wozniak J, Spencer T. Attention-deficit hyperactivity disorder with bipolar disorder: a familial subtype? *J Am Child Adolesc Psychiatry* 1997; 36 (10): 1378-1387.
20. Masi G, Perugi G, Toni C, Millepiedi S, Mucci M, Bertini N et al. Attention-deficit hyperactivity disorder-bipolar comorbidity in children and adolescents. *Bipolar Disord* 2006; 8 (4): 373-381.
21. Dumas JE. L'hyperactivité Psychopathologie de l'enfant et de l'adolescent. Bruxelles. De Boeck Université; 1999. p 179-222.
22. Zdanowicz N, Janne P, Reynaert Ch. Adolescence and diagnostics. *Psychological Reports* 1996; 78 (2): 459-466.