Chapter 1

ADHD Through Different Developmental Stages

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Additional information is available at the end of the chapter

http://dx.doi.org/10.5772/53963

1. Introduction

Persistent and severe impairment of psychological development resulting from a high level of inattentive, restless and impulsive behaviour is classified according to the fourth Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) as attention-deficit/hyperactivity disorder (ADHD) [1] and according to the Tenth International Classification of Diseases (ICD-10) as hyperkinetic disorder (HD) [2]. In both classifications the behaviours to be recognized are very much the same, they differ mostly in the ways the symptoms are weighted and combined into categories. The diagnostic criteria are in general broader in DSM-IV, which is why ADHD is a more common diagnosis. The ICD-10 diagnosis of HD is a narrower category, where nearly all cases of HD fulfil the diagnostic criteria for ADHD [3].

Hyperactivity is the most noticeable symptom group in ADHD. Children are running and climbing excessively, often in very inappropriate situations. They often fidget with their hands or feet when they should seat still. They are always on the go and often act as if driven by a motor. Inattention is the second markmal of ADHD. Children often fail to give close attention to details and make careless mistakes in their schoolwork or in other activities. They do not seem to listen when spoken to directly, they often do not follow through instructions and they fail to finish their schoolwork or other duties. Also, they have difficulties organizing their tasks and activities. They are easily distracted by extraneous stimuli and they tend to be forgetful in their daily activities. The third group of symptoms is impulsivity. Children have difficulty waiting their turn and interrupt or intrude on others.

The term *hyperactivity* in this chapter is restricted to mean the combination of symptoms that define overactive behaviour. The term *ADHD symptoms* is used to refer to the combination of hyperactive, impulsive and inattentive symptoms.

The onset of the disorder is in early childhood, nearly always before the age of 5 and frequently even earlier. It often persists into adolescence and adult life [4]. Up to 65% of chil-

dren with ADHD continue to experience symptoms as adults, however they manifest differently in different age periods. Hyperactivity, for instance, is seldom a problem in adults. It diminishes through adolescence and causes minimal or manageable problems in adulthood. Impulsivity, on the other hand, can even increase in adolescence but diminishes slightly through adulthood. The majority of ADHD problems in adults is caused by inattention. Adults with ADHD are disorganized, inaccurate, frequently experiencing difficulties in their relationships, at work and with finances [5,6].

Early recognition and treatment of ADHD is crucial, since longitudinal studies indicate that inattentive and restless behaviour is a developmental risk. Untreated ADHD is also a risk for a range of other mental disorders such as conduct disorder, oppositional defiant disorder, depression, and substance abuse or addiction. Many children with ADHD present with school difficulties including poor classroom participation and associated learning disabilities in reading, written expression, or mathematics. As a result, they receive low grades, are retained in a grade level or do not complete the school at the level they started with [4-6].

Untreated ADHD is not only a burden for a person with the disorder and its family, but also for a society in many aspects. For example, young adults with ADHD are more likely to be apprehended for violations of traffic laws and to be cited more often for such violations [7].

The treatment of ADHD must be comprehensive and individually tailored. Psychological interventions, educational change, medication, education and support for parents and/or teachers should be available. Multimodal interventions are usually indicated [4-6]. Most children whose problems are severe enough to receive an ICD-10 diagnosis of HD will need a medication [3]. There are clear guidelines about ADHD treatment including pharmacotherapy, which, however, will not be discussed further in this chapter. The most prescribed group of medication are psychostimulants and atomoxetine [8,9].

2. History

ADHD is not some new diagnosis made-up in these times when there is an increasing need for children to sit longer and learn more. Already back in 1844 H. Hoffman wrote a story about fidget Philip, and in 1890 W. James talked about the attention disorder as a deficit of inhibitory control. In 1932 Kramer and Pollnow introduced the term hyperkinetic syndrome. Only 4 years later (in 1937) the first psychostimulant was available. Strauss and Lethinen used the term minimal cerebral dysfunction to refer to the same symptomatic condition. World Health Organisation (WHO) introduced in ICD-8 hyperkinetic syndrome of childhood, to change it in 1992 to hyperkinetic disorder. American Psychiatric Association (APA), on the other hand, introduced in 1980 the term attention deficit disorder and 7 years later Attention-deficit/hyperactivity disorder (ADHD) [4-6].

Originally, ADHD was thought to be a transient phenomenon because of the tendency for symptoms (especially hyperactivity) to diminish as children reached adolescence. It is now clear that the disorder persists into adolescence and into adulthood, but manifests differently in each developmental stage [6].

3. DSM and ICD categorization

The DSM-IV classification is mostly used in North America and UK, while the ICD-10 is more commonly used in Europe. DSM-V is to come in a year. There was a tendency to bring definitions of ADHD and HD closer together, and indeed the criteria for the identification of inattentive, hyperactive and impulsive symptoms are almost identical (see diagnostic criteria in Table 1). However, there are still significant differences in the number of criteria in each domain required for a diagnosis, the role of inattention, the definition of pervasiveness and the handling of comorbidity. The diagnosis of ADHD requires the presence of six inattentive or six hyperactive-impulsive symptoms, or both. The diagnosis of HD requires at least six inattentive and three hyperactive as well as one impulsive symptom. Both – ICD-10 and DSM-IV – stress that the symptoms must be present by age 7 and in at least two settings (home/school) [1,2].

In DSM-V, the age by which the symptoms should be present is to be changed from 7 to 12 years [10]. One of the reasons for this change is the concern about appropriate criteria for adults. Population survey data indicated that in adults with ADHD, only half recalled onset by age 7 but 95% recalled the onset by age 12 [11].

Because of heterogeneity of symptoms in ADHD, three different subtypes are distinguished in the DSM-IV classification [1]:

- Attention-deficit/hyperactivity disorder, **combined type**: if both criteria A1 and A2 are met for the past 6 months
- Attention-deficit/hyperactivity disorder, **predominantly inattentive type (ADD):** if criterion A1 is met but criterion A2 is not met for the past 6 months
- Attention-deficit/hyperactivity disorder, **predominantly hyperactive-impulsive type**: if criterion A2 is met but criterion A1 is not met for the past 6 months.

HD is a narrower category than ADHD, and it appears that nearly all cases of HD fulfil the diagnostic criteria of ADHD [3]. Most of the children fulfilling the ADHD diagnostic criteria are not particularly impaired [6]. On the other hand, children with HD constitute the most severe 20% of those with ADHD [6]. Both diagnostic schemes (DSM and ICD) have their advantages and disadvantages. When assessing an individual child, first the fulfilment of the ADHD criteria is checked, and if the latter are met, the HD criteria fulfilment is checked as next. If the diagnostic criteria for HD are met, medication will be included in the treatment approaches available [3].

Essential components of a full assessment process include a clinical interview, medical examination and administration of rating scales to patients, parents and teachers. There are broad-band instruments that evaluate general behavioural and psychosocial functioning, among most used one being the Strengths and Difficulties Questionnaire (SDQ), Achenbach scales and Conners' Rating Scales (CRS) [8].

A. Either (1) or (2):
(1) six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:
Inattention
(a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
(b) often has difficulty sustaining attention in tasks or play activities
(c) often does not seem to listen when spoken to directly
(d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
(e) often has difficulty organizing tasks and activities
(f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
(g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
(h) is often easily distracted by extraneous stimuli
(i) is often forgetful in daily activities
(2) six (or more) of the following symptoms of hyperactivity/impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:
Hyperactivity
(a) often fidgets with hands or feet or squirms in seat
(b) often leaves seat in classroom or in other situations in which remaining seated is expected
(c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
(d) often has difficulty playing or engaging in leisure activities quietly
(e) is often "on the go" or often acts as if "driven by a motor"
(f) often talks excessively
Impulsivity
(g) often blurts out answers before questions have been completed
(h) often has difficulty awaiting turn
(i) often interrupts or intrudes on others (e.g., butts into conversations or games)
B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.
C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).
D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.
E. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, schizophrenia, or other psychotic disorder and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, or a personality disorder).

Table 1. Diagnostic criteria according to DSM-IV for attention-deficit/hyperactivity disorder [1].

4. ADHD through different developmental stages

The only constant of ADHD symptoms is that they are changing in each particular child. Not only from day to day, but also with development. In pre-school children, hyperactivity is most obvious and impairing. Inattention becomes more salient once a child confronts school demands. In adolescence and adulthood, hyperactivity diminishes, and inattention and impulsiveness become most impairing, especially in social situations.

4.1. ADHD in children

4.1.1. Epidemiology

The prevalence of ADHD depends on the diagnostic measures used. In [12] survey, 10% of the children in one elementary school in North Carolina had been given the diagnosis of ADHD and 7% were taking medication [12]. An epidemiological study found a cumulative incidence of ADHD in the elementary and secondary school population of 7.5% [13]. The rate of lifetime childhood diagnosis of ADHD in another study [14] was 7.8%, 4.3% were treated with medication [14]. Prevalence for HD is of course smaller, it is 1–3% for children aged 6–14 years [4].

The ratio males : females is around 3 : 1, the prevalence is highest among school-aged boys, and lowest in girls. But the prevalence in girls is more stable across the age [6].

4.1.2. Clinical picture

Hyperactivity is the most obvious and impairing symptom in children. At playing, hyperactive children are more often off-task and spend less time on a particular activity than their non-hyperactive peers [6]. Hyperactive children are more active through the day [6]. Many children without ADHD are occasionally hyperactive to some extent and this normal hyperactivity should not be confused with the more severe and persistent hyperactivity seen in ADHD children. In ADHD hyperactivity is frequent, severe and persistent and most importantly it interferes with a child's peer and parental relationships, impeding their school performance and undermining their psychological well- being [6]. Not to forget that there must be six symptoms from the hyperactivity domain present plus the criterion C (two or more settings) plus criterion D (clear evidence of clinically significant impairment in social, academic, or occupational functioning) to fulfil DSM-IV diagnostic criteria for ADHD [1].

Lack of hyperactivity, on the other hand, does not mean that a child does not have ADHD. Inattentiveness is the most overlooked symptom, especially in pre-school children and in particular in girls. Inattentive children are quiet, day-dreaming, sitting in the last row of the classroom without bothering/disturbing anyone. They have "dreamy" symptoms, typical for attention deficit disorder (ADD) [15] such as:

- difficulties in following instructions and organizing tasks
- tendency to avoid tasks

- forgetfulness and tendency to lose things

Among ADHD subtypes, combined type seems to be the most common (43%), and also the most severe and persistent one [15]. On the other hand, in [16] study the ADD type emerged as the most prevalent. This study also revealed lower male : female ratios in ADHD diagnoses than other studies, which implies that females and the ADD subtype could be underdiagnosed and/or undertreated [16].

Many children with ADHD present with school difficulties including failure to complete their homework, poor test preparation and test-taking skills, poor organizational skills, poor understanding of material, poor classroom participation and failure to ask teachers for needed help, disruptive behaviour in the classroom, and truancy. Children with ADHD who are constantly singled out by their teachers and parents to "sit down" and "be quiet," eventually have a negative perception (low self-esteem) of themselves. By age 10, these children are often behind their peers in terms of social and academic skills [17].

The social and academic impairments of children with ADHD cause stress within the family. Parents can become worried and anxious. Confronted with frustration, anger and self-blame can present with lower self-esteem as parents and as a family. The family seeks a social isolation, often self-imposed. It is difficult to determine if these effects are a result of parenting a child with ADHD or if the parental psychopathology is contributing to the child's psychological reaction and disorder [6,17].

As ADHD is among most heritable of psychiatric disorders with a high risk for familial aggregation, it is quite common that ADHD children have parents with the same disease. This fact further complicates the assessment, treatment and the course of disease. ADHD parents may have impairment across a variety of domains, including parenting [18], which could be the reason why many needed changes in a daily life of a child and family cannot/are harder to be indorsed. 20% to 40% are likely to have the disorder themselves [19]. Families of children with ADHD display higher rates of alcoholism, substance abuse and depression than families of children with Down's syndrome [20].

4.1.3. Comorbidity

Over 50% of children with ADHD have also comorbid disorders [4-6]. 35–50% have oppositional-defiant disorder, 25% conduct disorder, 15% are depressed and 25% have anxiety disorder [6]. Learning disorder occurs in 15–40% of children, particularly among ADD. Language impairment is present in 15–75% of children with ADHD [21,22].

Epilepsy is commoner in ADHD children compared with general population. 36% of children with epilepsy met DSM-IV criteria for ADHD. Neither seizure type nor focus of electroencephalographic (EEG) discharge predict the occurrence of ADHD, but there is a tendency for ADHD to occur more frequently in those with generalized seizures [23].

4.1.4. Course and prognosis

As normal children develop better impulse control, attention focus, other executive functions, and ability to remain calm as they mature, so do those with ADHD, just at slower pace, lagging behind their age mates – usually never reaching them [5]. Various factors have been suggested as predictors of persistence of ADHD symptoms into adolescence and adulthood (among them family history of ADHD, childhood severity of ADHD, psychiatric comorbidity and psychological adversity, impact of treatment) [15]. Among all the factors, studies have found that the childhood ADHD severity is a strongest predictor of persistence of ADHD into adolescence and adulthood [5,24].

Regarding the impact of treatment (intensity and type) on ADHD outcome, the MTA study found that neither the type nor intensity of 14 months of treatment for ADHD in childhood (at age 7.0–9.9 years old) does not predict functioning six-to-eight years later. Rather, early ADHD symptom trajectory regardless of treatment type is prognostic. This finding implies that children with behavioural and sociodemographic advantage, with the best response to any treatment, will have the best long-term prognosis [24]. The same study also found that as a group, however, despite initial symptom improvement during treatment that is largely maintained post-treatment, children with combined-type ADHD exhibit significant impairment in adolescence [24].

Across the life span, unmanaged ADHD can contribute to problems in social and academic settings that coincide with the child's developmental level. These are:

- Disruptive behaviour
- Oppositional defiant disorder
- Poor academic performance and learning delay
- Low self-esteem
- Poor social skills
- Parent-child relationship difficulties
- Physical injury

A review study found that children treated with stimulants for as long as 2 years showed improvement in ADHD symptoms, comorbid oppositional defiant disorder and academic and school functioning [25].

4.2. ADHD in adolescents

4.2.1. Epidemiology

ADHD does not remit with the onset of puberty. Follow-up studies show that a majority (60–85%) of children with ADHD will continue to meet criteria for the disorder during teenage years (ages 13-18 years) [26].

4.2.2. Clinical picture

At adolescence, symptoms of hyperactivity and impulsivity related to ADHD tend to diminish in intensity and are replaced with an inner restlessness, unableness to relax and feelings of unhappiness when not occupied [5]. Impulsivity presents in adolescents as interruptions of others, quick decisions, multitasking and feeling down when not occupied and feeling up when something is happening [5]. Inattention presents as disorganization, poor time management, not listening to what is being said and as forgetfulness.

The [15] study found variations within ADHD subtypes in children and adolescents in the clinical population. Combined subtype is the most common one in childhood (43%), but in adolescence ADD subtype is more common (64%) [15].

Symptoms of ADHD in adolescence most often manifest during instructional or vocational situations. ADHD adolescents show signs of procrastination and disorganization with schoolwork. 46.3% of them did not complete high school and 29.3% retained a grade level at least once and 10.6% have been suspended from school. Feelings of tension, apprehension, the need for reassurance, irritability, negative self-image, and physical complaints are reported in more than 70% of ADHD patients [7, 27].

4.2.3. Comorbidity

ADHD in adolescence, especially if not treated can result in further complication (school suspension and/or expulsion, social exclusion, poor motivation, teen pregnancy, driving accidents) and comorbid disorders (substance abuse or dependence, mood disorders, conduct disorders) [7, 17, 28].

Adolescents with (untreated) ADHD are more prone to substance abuse than their peers. In a [29] study the cumulative incidence of substance abuse disorders throughout adolescence was compared in 56 medicated ADHD patients, 19 non-medicated ADHD patients, and 137 non-ADHD control subjects. The analysis was restricted to male subjects older than 15 years of age. Substance abuse disorder was defined as any diagnosis of any of the following: alcohol abuse/dependence (A/D), marijuana A/D, hallucinogen A/D, stimulant A/D, and cocaine A/D [29]. Non-medicated ADHD patients were at a significantly higher risk for substance abuse than either controls or medicated ADHD patients during the follow-up period of 4 years. However, there was no significant difference between medicated ADHD patients and controls. Medication was found to be associated with an 85% reduction in the risk of substance abuse in ADHD patients [29].

ADHD and substance use disorder (SUD) may share also biological factors. Familial association between ADHD and SUD is strong, which suggests that two disorders may share genetic or other familial factors. The offspring of SUD parents are at greater risk not only for SUD, but also for inattention, impulsivity, aggressiveness, hyperactivity and ADHD [28].

4.2.4. Course and prognosis

It remains difficult to predict persistence of ADHD into adulthood. Controlling for severity and excluding treatment, none of the other variables (sociodemographics, childhood adversity, traumatic life experiences and comorbidity) significantly predicted persistence, even though they were significantly associated with childhood ADHD [30]. Many studies reported adult persistence was much greater for inattention than for hyperactivity/impulsivity [6,30].

4.3. ADHD in adults

4.3.1. Epidemiology

Being diagnosed with ADHD as an adult actually means that the condition has been present since childhood, it just was not recognized or diagnosed at that time. Many follow-up studies consistently documented the persistence of ADHD into adulthood, but the level of persistence has been inconsistent across studies [4-6, 31].

The first reason is the methodological, which includes changes in informant (patient's parents versus adult patient), use of different instruments to diagnose ADHD in adults, comorbidity and diagnostic criteria [31]. Diagnostic criteria are designed for school-aged children with regard to the number of symptoms required to meet the diagnostic threshold, which can be developmentally inappropriate for adults. Adults can suffer significant impairment even though they have fewer than six of nine symptoms needed for the diagnosis. The second reason is that differences in reported remission rates reflected the definition used for remission rather than disorder's course [31].

The persistence of the full syndrome of ADHD in adulthood has been found to be between 2–8% when self-report is used [31]. When parent report is used, the prevalence increases to 46% [28]. The [30] study reported that 1 in 3 childhood ADHD still met DSM-IV criteria when aged 18- to 44-years [30]. In [32] study 40% of 18- to 20-year-old "grown up" ADHD patients met full criteria for ADHD, but 90% had at least five symptoms of ADHD [32].

Taking all studies together, the rates of syndromatic remission of ADHD in adults are quite in agreement; from 60% [32] to 65%–70% [33]. But majority of subjects continue to struggle with substantial number of ADHD symptoms and high levels of dysfunction despite a sizable rate of syndromatic remission by age 20 [32].

4.3.2. Clinical picture

ADHD symptoms in adults manifest quite differently from the way they manifest in children. Hyperactivity is not impairing any more. It is rare to see ADHD adults fidgeting and/or running around. But some adult ADHD patients seem jittery and have trouble sitting still. Some complain of having "ants in their pants" and may experience an irritating need to pace [34]. Adults can learn through time to manage to settle their hyperactivity through exercise or hard physical work. But if they are temporarily immobilized (broken leg, somatic

illness) and are suddenly deprived of a coping method, their hyperactivity can present as aggression and/or agitation [34].

Symptoms of inattentiveness and impulsivity in adults manifest as [34]:

- forgetfulness, particularly if it involves remembering tasks or jobs that need to be done. They are often losing household items.
- unableness to keep track of several things at once
- difficulties in keeping promises or commitments to others
- making decisions impulsively, or on the spur of the moment, without thinking about the consequences
- frequently misjudge how much time they have – or need – to do something. They express difficulty with being on time.
- being unable to tear themselves away from something enjoyable to shift to a more urgent, important task
- they describe themselves having quick temper and low tolerance for frustration

Adults with (untreated) ADHD are at greater risk for further complications compared with general population: changing jobs and partners, unstable relationships, financial problems, involvedness in car accidents, injuries, crime, and substance abuse. 16-year follow-up study found that men who had ADHD as boys were significantly more likely to be financially dependent on their parents, less likely to graduate from college, and had a lower social class than controls. These functional deficits are likely to be aggravated by the higher levels of neuropsychological impairment, which was observed on psychometric tests and on behavioural measures of executive dysfunction [35].

In Norway study, only 22.2% adult ADHD patients had ordinary work as their source of income, compared with 72% in the general population [36]. Approximately 48% had junior high school as their highest degree of education, compared with 29.8% in the general Norwegian population. Thus, more than half had an educational level not suited for most domains in the work market. Only 8.9% had a college or university degree, compared with 20.8% in the general population. 33% of ADHD patients were receiving disability pension and 38% temporary social benefits. Maybe the most interesting founding in this study was the fact that only 17.4% of participants with adult ADHD had been treated with central stimulants by the age of 18. Results are suggesting that early recognition and drug treatment of ADHD might protect against occupational impairment in adulthood [36].

Young adult drivers with ADHD were found to be nearly twice as likely to be cited for unlawful speeding and to be cited more than three times as often as young adult subjects in the control group. Drivers with ADHD had more than 5 times as many traffic citations on their records than did controls [7].

4.3.3. Comorbidity

As in children and adolescents, adult ADHD is often present with comorbid disorders, which makes an accurate diagnosis even more difficult. Studies suggest that up to 90% of adult patients with ADHD have one or more comorbid psychiatric disorders [37]. The most common comorbid disorders in adults are anxiety disorders, affective disorders, substance abuse and antisocial personality disorder. In [36] study, the most prevalent comorbid disorders were lifetime depression (37.8%), substance abuse (28.1%) and alcohol abuse (23.3%), 14.6% had anxiety disorder. More than 19% had received a diagnosis of personality disorder. Interesting in this study was that more women then men had comorbid borderline personality disorder [36]. It is important to know that comorbid psychiatrics disorders emerge early on in development in childhood and adolescence [38].

Bipolar disorder coexists with adult ADHD in 6–20% cases. Many ADHD symptoms can be mistakenly attributed to and overlooked because of bipolar disorder [37]. Interesting results were found in [39] study, namely that ADHD brings significant impairment to bipolar patients, especially in adaptation and social functioning, compared with bipolar patients without comorbid ADHD. Even more interestingly, the authors failed to detect a significant impact of substance abuse on those same functional outcomes. This stresses out importance of making an accurate diagnosis of ADHD also in patients where the symptomatology (impulsiveness, multitasking, not finishing work, changing partners etc.) can be incorporated in another diagnosis (bipolar disorder) [39].

The high prevalence of comorbidity complicates the diagnostic process as well as treatment and some studies indicate that high rates of comorbidity in adult ADHD contribute negatively to the treatment outcome [40].

Follow-up periods into adulthood showed that stimulant treatment in childhood also was beneficial for social skills and self-esteem. Higher doses and longer treatment period predicted less comorbidity and better social functioning [25].

ADHD in adults have striking similarities with paediatric samples regarding psychiatric and cognitive impairment [41]. Some study suggest that the effect of stimulants is similar in paediatric and adult samples, which is a reason to believe that adult patients also will have long-term positive outcome [42].

5. Case report

8-year-old boy was admitted to Child and Adolescent Psychiatry Unit because he had been experiencing increasing behavioural problems in the school during the last 3 months. He also showed slowness in mental tasks, was very impulsive, self-willed, irritable and displayed enhanced verbal and physical aggression. *History of problems* revealed delayed schooling because of expressive language disorder. He was in the first grade of the primary school at admission, while his peers where in the second grade. His mother presented a list of complaints as if they were copied from the ADHD diagnostic criteria – he was always “on

the go", running and climbing whenever possible, when needed to sit still he was fidgeting, he talked excessively, blurted out answers, he could not await his turn, he intruded on others, did not listen to what was being said, lost things daily, was easily distracted and his school work was a disaster.

Developmental history revealed a risk pregnancy with malpresentation (not head down position of a fetus). He was the third child, prematurely born, with icterus and apnoeic attacks. He was lagging in motor development (he walked independently at the age of 20 months) and in language development (spoke the first words at the age of 3, he visited speech and language therapist).

Family history was interesting since his father had symptoms of ADHD in his youth. One of his two brothers uttered the first words at the age of five. *General assessment at admission* showed clumsiness and stuttering. *Further observations* showed that he was easily distracted, had lapses in attention, was overactive, impulsive and impatient. He usually acted without thinking, behaved inappropriately, was verbally and physically aggressive towards co-patients and medical staff, testing the limits all the time and showing stubbornness. He also seemed unhappy, sad and angry with sudden changes in mood.

Neuropsychological tests found organic-cerebral dysfunction, psychomotor and visuospatial disturbances and profound attention deficit with hyperactivity. His IQ at the time of testing was borderline due to severe inattention and hyperactivity. He presented with diminished inhibition, showed personally and emotionally less mature compared with his peers and he has been found as quite egocentric. *Basic laboratory tests* (including thyroid levels) and EEG were normal.

The boy fulfilled DSM-IV diagnostic criteria for ADHD – combined type. Because of his changing mood and aggressive periods which were new in his behaviour, bipolar disorder was considered as a possible *differential diagnosis or comorbid disorder*. His hyperactivity existed ever since he was born and was not episodic (which is typical for hyperactivity in bipolar disorder). He was easily distracted and mostly did not finish his tasks – but not because of flight of ideas, thought racing or delusions as seen in manic episodes. He was impulsive, blurting answers and interrupting – again not because of pressured speech or impulsive poor judgment as seen in manic episodes. His school performance was bad because of his inattention and not because of the loss of interest – as seen in depressed episodes of bipolar disorder. He was never grandiose and had never any appetite or weight changes often seen in bipolar patients. He was diagnosed as *ADHD combined type with comorbid oppositional-defiant and expressive language disorder*. He received psychostimulants, we educated his parents and his school teachers about the disorder and advised them about the behavioural management techniques. He continued visiting the speech therapists. He responded well to all introduced measures and we followed him for about a year when he moved to another city.

Nine years later (as 17-year-old) he was admitted again to our child and adolescent psychiatry ward. Parents complained about severe behavioural problems lasting for two years. He threatened with suicide several times, had constant difficulties with authority, was disregarding his safety and was involved in a series of injuries and accidents. He changed three

secondary schools, without finishing the first year in any of them. He was staying at home during the day, but went out in the evening taking his parent's money. When he took 2000 EUR, they started suspecting drug abuse for the first time

He acted quite aloof at admission. He sat quietly and admitted that he was smoking marihuana regularly for 3 years. He also tried ecstasy and cocaine several times – for the last time the weekend before. He drank alcohol regularly when he was in a company of others, otherwise he was too anxious. He had been playing poker for 3 years twice a week. He complained about his inner restlessness, which disappeared when he was on drugs or at least when he drank something. He revealed that he had rather poor peer relationships – actually he had no friends. He was unable to concentrate in school but had no problems concentrating at poker game or at other pleasure activities (computer games, TV). He felt that he was a loser; obviously he would not finish the school and he thought of suicide quite often.

He had been taking the medication for ADHD for two years (from the age of 8 till the age of 10), but stopped during the summer holidays. As he was no longer as hyperactive as before, his parents decided that he did not need it anymore. With a lot of help of his parents and instructors he somehow managed to finish the primary school, but at great cost – he struggled with extremely low self- esteem.

He was depressed and suicidal; anxious and tense but opponent to parents and medical staff at admission.

Neuropsychological tests at second hospitalization found organic-cerebral dysfunction, psychomotor and visuospatial disturbances as at the first testing. Actual IQ was discrepant with above average on verbal and lower borderline on non-verbal scale. Tests revealed executive deficits with diminished inhibition, planning, controlling and anticipation. Depressive symptomatic was also found.

He was fulfilling the DSM-IV diagnostic criteria for *ADHD – inattentive type and for major depressive disorder.* Again, bipolar disorder was considered as possible diagnosis, but was excluded due to a constant pattern of inattention, impulsive and hyperkinetic problems, without any episodic changes in ADHD or affective symptoms. He was treated with atomoxetine and antidepressants and he attended the program for addicted/at risk adolescents for a year. He managed to finish the first year of the secondary school. Then he stopped taking the medication and attending the program and started with marihuana and occasionally used other drugs again.

5.1. Discussion

Reported case describes prototypic ADHD child regarding the symptomatic and its changing over development, family attitude to medication and family stress, comorbidity in childhood and adolescence, and the course of disease.

It often happens that parents endure with hyperactivity symptoms and seek help only when school performance is critical. In severe ADHD cases, which also fulfil more strict ICD-10 diagnostic criteria for HD, the problems in school performance and behaviour are

obvious already in the first grade of primary school and are so severe that parents are faced with the necessity for special assessment and treatment. Comprehensive treatment that includes education and support to parents and teachers, and also pharmacotherapy is very effective. As in presented case, children manage developmental tasks quite well as long the treatment is provided. Hyperactivity symptoms diminish with development and many parents understand this as a signal that the child has grown up of the ADHD and they stop with the treatment.

But in majority of ADHD cases, the symptoms only present differently but continue to interfere further in adolescent/adult life as inner restlessness, tension and irritability. Patients have low school/work performance, are disorganized, have difficulties in social relationships, often abuse drugs, and are engaged in car accidences. As a further burden, the majority of them also have comorbid disorders such as depression, anxiety, bipolar disorder and personality disorder. The stress on family grows and the vicious circle of self-blame, avoidance of social contacts and low self-esteem repeats. In such cases, comprehensive treatment enables better schoolwork, settles inner restlessness and tension, resulting in lower need for drug abuse.

6. Conclusion

ADHD disorder is predominantly diagnosed in childhood, persisting into adolescence and adulthood in majority of cases. With development the symptoms change, which is the reason why many of the adolescent and adult ADHD patients stay unrecognised. High comorbidity in adolescence and adulthood is the second reason for ADHD unrecognition after childhood. The fact is that it is quite difficult to consider ADHD when patients complain about depressive symptoms, drug abuse or have a personality disorder. But with careful personal history which also involves patient's childhood (interview with patient's parents) and with the help of specialized ADHD questionnaires, ADHD can be properly diagnosed.

Comprehensive treatment is crucial in any developmental period. It is essential not only for reducing the core ADHD symptoms, but also for preventing many consequences of untreated ADHD and for ensuring better quality of life for patients and their families.

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