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ADHD in adults in a nutshell

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Abstract

ADHD (attention-deficit hyperactivity disorder), primarily only considered as a childhood condition, remains an underdiagnosed condition that also affects adult patients. High comorbidity and similarities to different psychiatric disorders impedes the diagnosis. Despite this, it is important for medical practitioners to detect ADHD symptoms and implement proper treatment to enhance patients' life quality. Treatment should be multimodal and involve both behavioral therapy and pharmacotherapy.

Key words: ADHD, ADHD in adults, ADHD adult onset, ADHD gender differences

Introduction

Attention-deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder which in adults is characterized by the triad – inattention, impulsivity and hyperactivity [1]. It is estimated that ADHD occurs in around 5% of children and adolescents. Because of its neurodevelopmental origin, it was considered to be only a childhood condition, but data has shown that adult-onset is possible. Numerous groups of adults did not present ADHD symptoms in childhood, or only presented subtle symptoms [2]. Because of the increasing number of affected adults in recent years, it continues to be an underdiagnosed condition which may lead to the decrease in life quality of a great number of persons [1]. Affected adults may experience such problems as lower educational levels, employment issues, financial problems, risky behaviors (e.g. substance overuse, fast driving), problems with the law, social relationship problems, difficulties with emotional expression [3,4]. Unfortunately, comorbidity with ADHD is common in the adult population, which may delay the implementation of proper treatment [4].

Definition and Diagnosis

ADHD was originally considered to be a childhood disorder, so all the diagnostic criteria were only prepared for young patients attending school. The number of recognitions in adults increased because of the DSM-V extension of the criteria [6]. They are the same for children and adults and they need to be adapted to the age of the patient.

The main symptom groups describing ADHD are inattention and hyperactivity/impulsivity appearing in different aspects of life [5]. Patients may have one or both of those more visible, allowing the clinician to describe their subtype of ADHD:

- predominantly inattentive presentation – present inattention criteria for at least 6 months, but not enough of the hyperactive/impulsive
- predominantly hyperactive-impulsive presentation – present hyperactive/impulsive criteria for at least 6 months, but not enough of the inattention
- combined presentation – present symptoms of both criteria for at least 6 months

1. **Inattention: Six or more symptoms of inattention for children up to the age of 16, or five or more for adolescents aged 17 years and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for their developmental level:**

- Often fails to pay close attention to details or makes careless mistakes in schoolwork, at work, or with other activities
- Often has trouble keeping attention on tasks or when playing
- Often does not seem to listen when spoken to directly
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, gets side-tracked)
- Often has trouble organizing tasks and activities
- Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework)
- Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones)
- Is often easily distracted
- Is often forgetful in daily activities

2. **Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity/impulsivity for children up to the age of 16, or five or more for adolescents age 17 years and older and adults; hyperactive-impulsive symptoms have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level:**

- Often fidgets with or taps hands or feet, or squirms in seat
- Often leaves seat in situations when remaining seated is expected
- Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless)
- Often unable to play or take part in leisure activities quietly
- Is often "on the go" acting as if "driven by a motor"
- Often talks excessively

• Often blurts out an answer before a question has been completed • Often has trouble waiting their turn • Often interrupts or intrudes on others (e.g., butts into conversations or games) **3. In addition, the following conditions must be met:** • Several inattentive or hyperactive-impulsive symptoms were present before age 12 • Several symptoms are present in two or more settings, (such as at home, school or work; with friends or relatives; in other activities) • There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning • The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder); the symptoms do not only happen during an episode of schizophrenia or other psychotic disorder

Table 1. DSM-V criteria for diagnosing ADHD [7].

ADHD symptoms are fluid throughout a lifetime and the type may change [1]. Children do not "heal" from ADHD, but its clinical manifestation changes [8]. In childhood, hyperactivity symptoms are more dominant, in adulthood – inattention symptoms [9]. Still, the combined type is the most frequent in adults (70% of adult cases) [10]. Statistics show that 80% of adults diagnosed with ADHD did not present symptoms in childhood [2]. 30-60% of children's ADHD symptoms persist into adulthood [1]. From the clinical point of view, according to those statistics, it is crucial to actively search for ADHD symptoms in every age group while noticing persisting core ADHD symptoms.

Individuals' resources are crucial for the condition course. Internal factors, such as a high IQ level, or external factors, such as supporting parents, may reduce the level of impairment by developing coping methods [4].

Comorbidity

A problematic fact in adults is the prevalence of ADHD with other mental disorders [10, 11]. Approximately 45% of diagnosed patients manifest comorbidity with mood disorders, including major depressive episodes, bipolar disorder and dysthymia [10,12]. Not only does comorbidity postpone the proper diagnosis, but also the treatment. Existing ADHD symptoms influence productivity, social relations, financial situations, motivation, self-esteem, which significantly impacts an individual's mood and social functioning [1,8,10,12,13]. Research showing the relation between ADHD and mental disorders points to a common neurodevelopmental origin of those conditions – changes in grey and white matter have been observed in MRIs in various independent studies. The presence of comorbid psychiatric disorders is not related to the subtype of ADHD or gender, but anxiety symptoms are more common in the combined type. Generalized anxiety disorder (GAD) coexisting with ADHD increases the risk of suicide more than twofold compared to patients suffering from GAD only [13].

Risk Factors

Because of the presence of brain abnormalities, ADHD can be hereditary. Studies show that ADHD is a result of many gene mutations. Also, genetic factors contribute to coexisting comorbid disorders. Having a first-degree relative with an ADHD diagnosis increases the risk of this condition up to around 40%-90%. Monozygotic twins get the highest heritability score, but it does not reach 100%. This is the proof of the big role played by environmental factors [14,15,16]. Studies show the influence of preterm birth for ADHD occurrence [17], as does fetal exposure to maternal smoking, drinking alcohol and exposure to chemicals, and to a lower degree pregnancy and delivery complications, as well as the individual's response to their environment [18].

Differences Between Sexes

In males there is a significantly higher risk of neurodevelopmental disorders an estimated 2-4 times more often than in females. When it comes to ADHD specifically, in childhood the ratio of male to female diagnosis is around 3:1, but in adulthood it is lowered to around 1:1. This is mainly caused by more noticeable symptoms of hyperactivity occurring in boys, and a later onset

occurring in women [19]. Studies show that symptoms of ADHD in males and females vary, as we can see in the table below. Men's symptoms revolve more around externalizing, women's around internalizing. Males present conduct disorders more often, such as oppositional defiant disorder, criminal offences or psychopathy. Females are more likely to be diagnosed with an affective disorder compared to males; they also present more suicidal ideas or behaviors. Females with ADHD have a risk twice as high of unplanned pregnancy as do females without ADHD due to risky sexual behaviors.

Symptom	***Frequency of occurrence***
Inattention	F>M
Hyperactivity/impulsivity	M>F
Deficit in executive functioning	M=F
Depression	M=F
Anxiety	F>M or F=M *
Suicidal behaviors and thought	F>M
Conduct disorders	M>F
Psychiatric hospitalizations	F>M
Substance abuse	M>F
Difficulties at work	F>M

Abbreviations: M – male, F- female.

*Depending on the source.

Table 2. Gender differences in ADHD [20,21].

Due to those symptoms, both males and females face greater problems with maintaining relationships, having stable employment or having good life quality because of mood disorders.

Treatment Options

The treatment for ADHD should be multimodal – both pharmacological and non-pharmacological. The most important task is to reduce impairment symptoms and to enhance life quality. Medications help to reduce symptoms on a chemical level, non-pharmacological methods help to adapt to ADHD symptoms and cope with them. Pharmacological treatment remains the basis of ADHD treatment [1].

There are two main groups of medications – stimulants and non-stimulants. The most studied and most popular medications in therapy are psychostimulants: methylphenidate and amphetamines. Non-stimulants are second-line drugs: atomoxetine, guanfacine and clonidine – used when side effects occur or when the response to stimulants is not sufficient. The mechanism of most ADHD medications is to increase the level of dopamine or noradrenaline in the synaptic cleft [22].

Methylphenidate and other amphetamines are similarly effective. They also have similar side effects, such as anorexia and insomnia, but also cardiac effects – tachycardia, hypertension or chest pain. Cases of sudden cardiac death have been reported in patients with cardiac disease, though it happens very rarely. Side effects affect a third of patients. Despite this, stimulants are safe in the general population, but it is necessary to perform an electrocardiogram before implementing treatment. Around 70% of patients respond to stimulant treatment. To achieve the best effects, pharmacological treatment should be linked with behavioral management [23].

Atomoxetine, the second-line medication, doesn't have as noticeable an effect as stimulants, but can also be introduced in patients with ADHD. Another similar medication used for inattention is bupropion. Both drugs can cause irritability, insomnia, but also liver dysfunction, so blood tests of liver parameters should be conducted in case upper abdominal pain occurs [23].

Polypharmacy is sometimes needed in patients with comorbid conditions. In patients with ADHD combined with conduct behaviors related to the above-mentioned medications, behavioral therapy, alpha-adrenergic agonists (e.g. clonidine) or second-generation antipsychotics (e.g. risperidone) should be implemented. Bipolar disorder comorbid with ADHD should be treated by second-generation antipsychotics, then stimulants can be added, or in

different strategies atomoxetine, an alpha agonist or bupropion can be used. In the case of comorbidity with major depression, bupropion or SSRI (selective serotonin reuptake inhibitors) can be combined with the stimulants. Alpha-agonists with atomoxetine and behavioral therapy can also be used. In patients with comorbid anxiety, atomoxetine can be implemented, but also SSRIs with stimulants or alpha-2-agonists with cognitive therapy. ADHD with comorbid substance abuse should be treated with atomoxetine, bupropion or alpha agonists; stimulants that are difficult to abuse (e.g. lisdexamfetamine) can also be recommended. In ADHD with tics, alpha-2-agonists or atomoxetine can be used [22,23].

Some sources report that diet may reduce the main symptoms of ADHD. This diet should be based on the elimination of artificial food colorings and sodium benzoate preservatives [23].

Behavioral therapy plays a major role in ADHD treatment. Cognitive behavioral therapy has reported effectiveness, especially with comorbid mood disorders, but most guidelines recommend behavioral interventions for ADHD in any situation. Cognitive training strategies (e.g., attentional control, working memory, inhibitory control) based on brain plasticity can strengthen neuronal connections and improve functioning [8,22,23,24].

Another non-pharmacological strategy for managing ADHD symptoms is neurofeedback. By measuring a patient's brain activity, this technique helps one gain control over the symptoms. It does not treat ADHD, but can help improve cognitive functioning when included in multimodal therapy [25].

Conclusion

A diagnosis of ADHD could be difficult to make, especially because it was thought to only be a childhood condition. Studies have shown that ADHD can also affect adult men and women. Differences between genders' symptoms vary, so clinicians must pay attention to many aspects of impairment affecting males and females. It is crucial to implement proper treatment and practitioners should note the possibility of existing comorbid psychiatric disorders and correct the treatment for those cases. Coexisting somatic diseases, such as heart or other diseases, should be taken into consideration with choosing the proper medication.

Usunięto[Guest User]:

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