

# The Main Methods of Diagnosis and Basic Approaches to Treatment of the Attention Deficit Hyperactivity Disorder

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## Keywords

Attention-Deficite Hyperactivity Disorder, Diagnostic, Treatment

The differential diagnosis of primary ADHD should be aware that a child arises out of complexity in the development of the curriculum due to cognitive disfunction, logical and abstract thinking is complicated. Diagnosis of ADHD involves the use of a wide range of experimental psychological and instrumental tests, the main of which are given in this article. Treatment of patients with ADHD include psycho-pedagogical correction in patients with mild ADHD to moderate forms of drug therapy, the use of various trainings aimed at improving cognitive functions, classes with a speech therapist and a neuropsychologist. Also in this article represented the results are based on a "audiogram" CT and MRI and functional MRI are listed according to the literature respectively, and drug therapy of patients with ADHD.

## Introduction

The prevalence of attention deficit hyperactivity disorder (ADHD) among pupils is 4-9%, boys 4-5 times dominating; the first symptoms appear before the age of 7 years. ADHD is more common in children, whose parents abuse alcohol, have a low income; in families where relatives suffer from disorders of behavior, ADHD is often associated with developmental delay, speech disorders, accounts disorders, read- and writing deficit [11, 13, 18, 30]. The following multi center studies [1] with the participation of 3,000 schoolchildren in Moscow showed that up to 17% of the children with the school disadaptation, are due to violations of the formation of cognitive functions [17, 20]. The earliest symptoms of ADHD are described in children aged 3 years in the form of symptoms of hyperactivity and disruptive behavior, inattention is detected mainly in the learning process. ADHD is considered as a behavioral disorder, often combined with other variants of developmental disorders of speech, coordination, Tourette's syndrome. Symptoms of ADHD persist in 50-80% of adolescents, then join behavioral disorders, failure to comply with adults, the inadequacy of the behavior, the difficulties of work organization, 23% did not finish high school. 25% of adults are observed with behavioral disturbances, conflicts, complexity of the work, alcohol abuse and drug addiction. 50% of younger patients preserve difficulty concentrating and braking impulsive behavior [11]. At the youth age there are 80% of adolescents with ADHD, along with oppositional behavior develop bipolar disorders[19, 26]. The literature discusses the nosological specificity of ADHD, since prospective studies show its evolution in various mental illnesses in adults.

## Main Body

There are idiopathic or primary and secondary ADHD, symptomatic due to perinatal brain injury, an illness such as

encephalitis, stroke, traumatic brain injury [22, 25].

ADHD is 6-7 times more common in people with the 1st degree relatives with this syndrome, and in identical twins ADHD manifests itself in 60- 81% of cases. The genetic studies have shown the connection of D4 receptor gene of chromosome 11.p 15.5 and mutation - dopamine transporter DAT1 [12, 16, 24]. In accordance with the hypothesis of R. Barkley [3], in the braking system and control functions there are disorders of behavioral inhibition, which work out memory regulation of motivation and motor control. Topography damage fits into the premotor area of the frontal lobe and right hemisphere frontostriatal system. 80% of patients have a combination of disorders of attention with hyperactivity and impulsivity, 15% of the disease occurs only negligence and 5% - a combination of hyperactivity impulsivity [14, 25]. Manifestations of ADHD are always present in all spheres of activity in school and at home, the sudden appearance of his physician should adjust the debut to the diagnosis of neurological or mental illness. At an early age, these children frequently have insomnia - difficulty falling asleep and frequent awakening, marked difficulty with feeding, eating disorders in the early and preschool age [2, 7, 8, 29].

According to DSM-IV [18] there are three options syndrome: with a predominance of inattention; with a predominance of hyperactivity and pulse intensity; mixed type (uniform expression of attention and hyperactivity disorders).

Diagnostic criteria for ADHD are inattention DSM- IV / distractibility, hyperactivity, impulsivity. Inattention / distractibility seen in the following: 1) the child can not concentrate, when piloted with, makes a lot of mistakes because of inattention; 2) difficulty sustaining attention in tasks or during games; 3) Easy distractibility relative to extraneous stimulus; 4) inability to complete the task; 5) ability to listen to, but seems not to hear; 6) avoidance of tasks that require constant attention; 7) bad organization; 8) The part of the loss of personal belongings needed in school and at home (pencils, books, tools, toys); 9) forgetfulness.

Hyperactivity - is: 1) the inability to play quietly, calmly; 2) often have restless motion in the hands and feet; 3) getting up frequently during the classroom or in other situations where you need to remain on place; 4) the inability to safely play or to do something in his spare time; 5) constant focus on movement, excessive mobility; 6) circumlocution.

It is said - impulsivity, when we have the following behaviors: 1) the child answers questions without hesitation, without waiting until the end of the question; 2) prevent other aimlessly but repeated appeals to people; 3) difficulty waiting their turn in the game; 4) often making dangerous steps for range, without thinking about the consequences.

From these signs of inattention, hyperactivity and impulsivity at least 6 must be maintained for at least 6 months. These signs are found in at least two areas (in school, at home, at work, games) and not due to psychotic, anxiety, mood disorders and psychopathy. Available disorders cause significant discomfort and psychological disadaptation.

Possibility of syndrome to be made in points allows to estimate the scale of Connors [15], designed to fill a parent or a doctor and applicable for evaluating the effectiveness of teaching and pharmacological interventions.

Evaluation of the results of the test: the presence of ADHD suggest boys having more than 25 points, for girls - at least 22 points. Proceeding from the above profiles, in his practice, we use the following gradation of a severe assessment of ADHD in points: mild ADHD - with the boys 26-34 points, in girls - 23-31 points; moderate - boys 35-43 score while the girls - 32-40 points; severe ADHD - boys - 44-54 points while girls - 41-54 points.

Net version of ADHD is found in no more than 2% of children, the majority is described with comorbid disorder: developmental disorders of speech, coordination, invoices and various behavioral disorders. Oppositional behavior, conflict can persist into adulthood, making it difficult to move to adequately social adaptation. Adverse symptoms are cases of persistent aggression [26].

As an "ADHD-plus" [3, 6] is considered a variant of ADHD characterized by disorders such as dysphasia, memory disorders, writing, reading. As a rule, there are difficulties in understanding the pathogenesis of the syndrome, namely, that violates the primary education - attention deficit disorder or developmental disorder of speech.

Children with attention deficit hyperactivity disorder without compared to patients with ADHD better perform repetitive tasks, are characterized by a favorable prognosis school adaptation. Additional classes with teachers can bring success in the comprehension of the training program.

In the differential diagnosis of primary ADHD should be aware that a child arises out of complexity in the development of the curriculum due to cognitive disfunction, logical and abstract thinking is complicated. At home and during the game activity negligence level. Pre-school problems with attention deficit hyperactivity disorder are minimal [6]. Acquired organic lesion of the central nervous system, frontal and temporal lobes after a traumatic brain injury, encephalitis, stroke, impaired

development of speech functions often combined with attention deficit hyperactivity disorder; similar condition described in children with temporal lobe epilepsy and autism.

**Table 1. Methods of diagnosis of ADHD.**

|   |   |
|---|---|
| The study of short-term memory, 10 words Luria's test | Type curve - exhaustion;<br>type of curve rigid;<br>reducing reaction at 5 presenting (8-10 words)  |
| The study of writing, reading, numeracy               | Writing under dictation, copying text;<br>Study reading (reading aloud);<br>Study accounts (forward and reverse through, multiplication tables, addition, subtraction, division)  |
| The study of praxis                                   | Evaluation of the implementation of simple and complex purposeful movements (to fasten and unfasten the buttons, comb your hair, whistle, blow out the candle);<br>execution of actions with imaginary objects (to show how to hammer nails, unlock the lock);<br>perform gestures (threatening gestures forefinger, tilt lock of hair from his forehead);<br>imitation of the actions of the investigator (clap hands)   |
| The research of impressive and expressive speech      | Status articulation device (lips, tongue, teeth, palate);<br>study of oral praxis (bombast, stretching the lips, tongue movements, etc.);<br>speech breathing (coordinated, uncoordinated, superficial, something deep, etc.);<br>voice (loud, quiet, immodulated, fading, with a touch of the nose, etc.);<br>impressive speech (understanding instructions, matching the subject and the words, understanding of complex logical-grammatical instruction);<br>expressive speech (rhythm, tempo, intonation, vocabulary); zvukoproiznosheniya (broken, not broken) |
| audiogram   | norm  |
| X-ray computed tomography (CT)                        | The asymmetry of the caudate nuclei   |
| Magnetic resonance imaging (MRI)                      | Easy hypoplasia of the frontal lobes, the striatal system, the corpus callosum  |
| Functional MRI  | Reduction of perfusion in the prefrontal areas  |

Note. The results are based on a "audiogram" CT and MRI and functional MRI are listed according to the literature - [3], [12] and [17] respectively.

**Table 2. Drug therapy of patients with ADHD.**

|   |  |  |  |
|---|--|--|--|
| Hopantenic acid (pantokaltsin, Pantogamum) [5, 9]                               | The daily dose of from 0.75 mg to 1.5 mg in 2-3 hours; (40-75 mg / kg body weight)             | From 8 weeks (short course) up to 4 months (long course) | Rhinitis, conjunctivitis, skin rashes, sleep disturbances  |
| Methylphenidate (Merida, Ritalin, centedrine) [22]                              | 0.3-0.8 mg / kg per day (no more than 60 mg 2 times daily)                                     | Less than 30 days  | Sleep disturbances, irritability, anxiety, headache, increased blood pressure, disturbances of appetite, dry mouth |
| pemoline *  | C 37 mg 1 time per day, gradually increasing the dose to 18 mg per week to 56 or 75 mg per day | Less than 30 days  | Sleep disturbances, irritability, anxiety, headache, increased blood pressure, disturbances of appetite, dry mouth |
| Pyritinol (encephabol) - used in cases with a predominance of negligence [3, 4] | 10 mg / kg - 400-600 mg  | 8 weeks  | Nausea, vomiting, sleep disturbances, headache, dizziness  |
| Clonidine [11]  | 4 to 5 mg / kg body weight   |  | Lowering blood pressure  |
| Amitriptyline - in cases with a predominance of impulsivity [27]                | 6-12 mg in 2 divided doses; from 6 to 12 years of 1-5 mg / kg body weight                      | Up to 3 months   | Dry mouth, constipation, drowsiness, dizziness, tremor   |
| ** Strattera (atomoxetine) [3, 6, 10, 23]                                       | 0.5-1.8 mg / kg 6-18 years; reception 1-2 times a day (morning, lunch)                         | 6-8 weeks (short course); 1-2 years (long course)        | Loss of appetite, irritability, dermatitis, sleep disorders in adults, dizziness, weight loss                      |

Note. \* - Pemoline is not registered in the Russian Federation; \*\* - Adverse events in the appointment Strater occur with a frequency of 1-10%.

This super focus is still treated as the lack of flexibility of psychological installation, such children are difficult to switch to the new incentives, it is often associated with oppositional and defiant behavior. Such children are prone to depression, anxiety, difficult adaptation in a group [6].

Disorders of attention and internal distractibility, receipt of large amounts of information cause situational hyperactivity, non-response nervous threat, anticipation of punishment for poor academic performance, depression. W. Weinberg and R. Brumback [30] described in 1990 "distress syndrome vigilance." Suffering children can not long sustain attention in tasks requiring by mentally continuous activities (eg, reading), complain about boredom, they quickly develop sleepiness, but sleep does not lead to an increase of able-bodied. They're hard to wake up in the morning, slow, but in gaming activities are active, talkative, outgoing, sociable and friendly, like distribution affects long history with details. The disorder has an autosomal dominant mode of inheritance.

Symptoms must occur for at least 12 months, and they are called drug-related to other neurological disease. According to described effects of methylphenidate, it is recommended to have sessions with short breaks, to use tasks without repetition and with a limited number of items.

When violations of attention take place, distractibility is associated with the child while he is busy with his thoughts, a favorite pastime, and the redundancy of information leads to situational hyperactivity.

Extrapyramidal syndromes often associated with the deficit of attention and hyperactivity syndrome, the most common condition - chronic tics and Tourette's syndrome. According to our observations, patients with tics ADHD observed in 20-40% of cases, while Tourette's syndrome - 70% of patients. Characteristically, an exacerbation of symptoms of inattention with tic hyperkinesias is sharply increasing. Treatment of the underlying disease leads to regression of inattention and hyperactivity.

## Conclusion

Diagnosis of ADHD involves the use of a wide range of experimental psychological and instrumental tests, the main of which are given in Table. 1.

Treatment of patients with ADHD include psycho-pedagogical correction in patients with mild ADHD to moderate forms of drug therapy, the use of various trainings aimed at improving cognitive functions, classes with a speech therapist and a neuropsychologist. Correctional pedagogics include games, dancing, drawing. Sensory education is applied using a variety of training methods, it is possible to use the Montessori method. Drug treatment of ADHD involves the use of psychotropic drugs and neurometabolic. These data are summarized in Table. 2. ■



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