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Psychomotor hyperactivity in children

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Abstract

Psychomotor hyperactivity syndrome with attention deficit disorders is a neurodevelopmental disorder, which is manifested by excessive mobility and impulsivity preventing normal functioning in society. This leads to deconcentration during the basic activities of everyday life. The first symptoms of the disease may appear in the early pre-school period of childhood, but they may not be sufficiently noticeable yet. The severity of symptoms may depend on the situation and may evolve with the age of the child. The etiology of the disease is not clear, which makes it elusive to identify the cause. However, we know that ADHD affects three times more boys than girls. There is a concept that statistics on increased male morbidity may be due to inheritance, as the female sex is the carrier of the gene responsible for the occurrence of hyperactivity. The aim of this paper is to describe the

characteristics of hyperkinetic disorder, including symptoms, etiology and some forms of treatment.

Key words: ADHD, psychomotor hyperactivity, children, symptoms

Introduction

Psychomotor hyperactivity syndrome is defined by various terminology, such as: hyperactivity syndrome, childhood nervousnesor ADHD (Attention Deficit Hyperacitvity Disorder). In Poland this abbreviation is understood as a psychomotor hyperexcitability syndrome with attention deficit disorders, because it is a term commonly used by the American Psychiatric Association DSM-IV classification. According to WHO, the appropriate term is also: hyperkinetic syndrome. An increase in the number of diagnoses can be observed, which results from survival, i.e. the functioning of a larger group of minors with deficits in our environment, as well as placing high expectations in front of the child and the influence of too many stimuli on them [1]. ADHD is a neurodevelopmental disorder occurring in about 7.2% of childhood patients [2, 3]. The diagnosis is most often made in children aged 6-9 years and is based on above-average impulsiveness, mobility and maladjustment to the education system. Hyperkinetic syndrome is more common in boys than in girls [4]. The general picture of the disease usually varies from gender to gender, although there is no rule for this. Due to the generally accepted sensitivity of the female sex, girls are more likely to have difficulties in focusing attention, anxiety or depression than boys [5]. The first symptoms can be observed in pre-school-age children, whereas in 60-80% of patients the problem will last until puberty or even adulthood. This may result in learning difficulties, difficult relationships with the partner, aggressive behaviour, anxiety, depression, crime and abuse of psychoactive substances [6].

ADHD symptoms:

The diagnosis is based on the observation of the child's response to stimuli from the external environment and a well-defined history referring to the assumptions made in the International Classification of Diseases: DSM-5 or ICD-10 [7]. In order to diagnose ADHD, behaviour deficits or, conversely, excessive expression of emotions in a child should be observed, and these behaviours will not be compatible with age. The occurrence of symptoms does not pass with the passage of six months, and their intensification leads to a dysfunction of the functioning of the basic spheres of life. By juxtaposing a child affected by hyperkinetic syndrome with its peers, it is possible to see differences in development, reaction to external stimuli, and knowledge [8, 9]. There are components of behavioural patterns characteristic of

this problem, which concern both the mental and physical spheres of the body. A typical image is a tendency to aimless, unjustified and excessive motor activity of upper and lower limbs, which makes the child notoriously alive and mobile and restless. When there is a situation that forces the body to reduce its movements, the small motoring performed around the nearest environment compensates for the inability to perform the whole body's activity. If the spontaneous activity has to be reduced, it can lead to involuntary movements or ticks. Another pattern of behaviour of a child is violent reactions, characterized by increased impulsivity and lack of ability to stop the reaction - a disorder of self-control. Management is reckless, despite the knowledge of how to behave. The patient is not able to rationally rethink his or her behaviour, its rightness and the effects of his or her actions. Written statements are inconsistent, with numerous comments and ill-considered, while verbal communication is difficult due to chaotic statements and interruption of other participants in the conversation. The sick person recklessly approves of other people's ideas. It happens that he inadvertently spoils things. The inability to focus attention for a long time, regardless of the external factors, is another model to follow. An attempt at concentration causes considerable fatigue, superficial perception of auditory stimuli and impaired perceptiveness. Many activities become impossible because the child quickly forgets what he or she wanted to do or neglects the things needed to do a particular activity. The difficulty arises when following the instructions and remembering specific information [9].

In the ICD-10, the criteria for the diagnosis of ADHD take into account abnormal, exacerbating reactions in various situations of varying duration, lasting for no less than 6 months, which do not result from the occurrence of other disorders, such as autism or bipolar affective disorders. The adopted criteria take into account:

1. Deficiency of attention, as evidenced by at least six of the following symptoms, resulting in behaviour that is incompatible with the child's developmental stage:

- repeated omission of details or notorious mistakes in everyday life activities,
- frequent difficulties in focusing attention on the tasks entrusted to them or while playing,
- difficulty in receiving information when speaking words towards the child,
- multiple failures while performing the tasks as instructed,
- lack of self-organisation skills,
- multiple avoidance of activity requiring consequences,
- repetitive loss of objects needed for certain activities,
- multiple distractions by external factors,

- common forgetting in the course of everyday life [4].

2. Increased activity manifesting not less than 3 symptoms, consequently leading to behaviours contrary to the child's developmental stage:

- continuous movement of upper or lower limbs,
- lack of ability to adapt to a situation that requires a longer sitting position,
- frequent excessive movement or interference in inappropriate circumstances,
- repeated, disproportionate noise during play or leisure time,
- an established pattern of physical activity, which in principle remains unchanged by social conditions and expectations [4].

3. Impulse rate of at least three symptoms, leading to behaviour that is incompatible with the developmental stage of the child:

- overtaking the speech before the interlocutor finishes the question or sentence,
- impatience in everyday life activities and situations,
- repeatedly interfere with the interlocutor by interrupting their statements or interfere with other people's activities,
- an immoderate expression of one's opinion, regardless of social limitations [4].

4. First symptoms of the disease - up to 7 years of age

5. Comprehensiveness - criteria must be met in many situations in which a child can be observed by a parent, teacher, doctor. Confirmation of behavior in different places and circumstances will be necessary from more than one source.

6. The symptoms listed in points 1-3 lead to suffering or impairment that is clinically significant in the professional, educational or social spheres.

7. The disease does not concern developmental disorders, mania, depressive episode or neuroses [4].

Types of ADHD:

The classification of the American Psychiatric Association (DSM-IV) distinguishes three subtypes in the psychomotor hyperactivity syndrome:

- the component with the predominance of immobility and impulsiveness is characterized by constant movement, which makes the child happy with regard to the possibility of continuous movements [9]. This type, if properly attracted, is able to focus on a task, homework or play for a longer period of time. Children are talented, learn well, but are not able to endure the whole lesson without getting up from the bench. Due to the desire for continuous movement, there may be problems in communicating with peers and teachers [4].

- a disorder with a predominance of attention deficits is characterized by a reduced focus on tasks, although in some situations the child is able to function in stillness [9]. In adult perception, such children are perceived as less intelligent, with learning difficulties. In fact, the patients affected do not have mental deficits, but the problem with concentration makes them unable to complete the tasks they have started, and during the tests they unconsciously make mistakes [4].
- the mixed subtype combines a component with the predominance of hyper-mobility and impulsiveness, together with a disorder with the predominance of attention deficits, resulting in the occurrence of these symptoms in one individual [9]

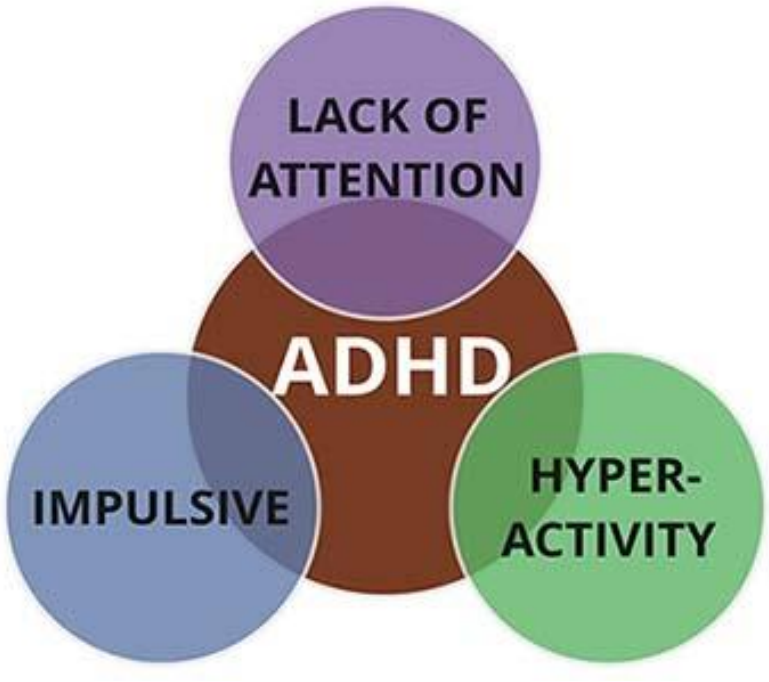

Fig. 1: Symptoms of ADHD [10].

E.M. Hallowel and J.J. Ratey distinguished the subtypes of ADHD documented by them in clinical trials with coexisting disorders that relate to secondary symptoms of coexisting hyperkinetic syndrome developing over time:

- without a psychomotor hyperactivity,
- with a feeling of fear,
- with depression,
- with learning difficulties,
- with excitement or mania,
- with an addiction to psychotropic substances,

- in artists with a desire for strong emotions,
- with states of dissociation,
- with signs of emotional instability,
- in children with behavioural disorders or rebellious and negativeist disorders,
- with anankastic syndrome [11].

Etiology:

One of the likely causes of ADHD is imbalance of nervous processes, i.e. domination of excitatory mechanisms over inhibitory ones. The factor leading to hyperkinetic syndrome may be genetic abnormalities. The male sex is more often ill, which may be related to the fact that women carry the gene responsible for the occurrence of the hyperactivity syndrome. At about 14 years of age, symptoms of the disease may withdraw as the child matures. However, the symptoms do not disappear in all cases. Some people do not grow out of the disease and have a problem in adult life. Improper influence of the environment, such as pathology in the family or the immediate environment, stimulants, experiencing an argument between parents may also have an impact on the activation of the disease through a state of excitement resulting from emotions suppressed in themselves - fear, tension, feelings of danger. Overprotection of parents or, on the contrary, rigorous upbringing may also become a cause [12]. Although we cannot unequivocally determine the cause of the disease, on the basis of neuroimaging studies and the effects of pharmacological treatment, it is believed that the dopaminergic development of neurons in the prefrontal cortex and subcortical areas is impaired. Environmental stimuli are a potential factor in ADHD etiology. Presumably modifiable, they may be a target for disease prevention as well as a basis for the introduction of new therapies for certain aspects of ADHD [3]. Nowadays, there are many potential factors that may be the cause of ADHD. The probable circumstances of the disease development complement each other and affect each other. This type of disease is more commonly manifested in families with similar cases in previous generations [1].

Treatment:

At present, a multifaceted approach to the ADHD problem is essential. We use pharmacotherapy, psychotherapy and psychosocial influence. Psychotherapy is designed directly for a disturbed person, in the form of group or individual therapy, or family therapy is practiced if there are pathological patterns in it. Psychosocial interaction is an important factor because it is about explaining to both the child and the parents or teachers the nature of the disorder and talking about the problem and encouraging them to focus on behaviour. In such a case, the school has the possibility to cooperate with a psychological-educational counselling

centre, and the closest family members can take advantage of the recommendations on educational methods. In the hyperactivity syndrome, pharmacotherapy is not used to treat the disease, but only to control the symptoms. Pharmacological treatment is dedicated to children in whom other methods do not bring results. The use of medicines by children is recommended as the last form of treatment because it often results in poor tolerance, leading to side effects such as: anorexia, insomnia, irritability, anxiety, increased sensitivity, intensification of nervous ticks and headaches. In the brain of the affected child, dopamine and/or noradrenaline levels in brain tissue are reduced, so pharmacotherapy usually increases the amount of dopamine and/or noradrenaline in the body [2, 13, 14].

ADHD therapy should take into account the type and severity of the individual symptoms and the educational and social situation of the child. The choice of method should be subordinated to the type of hyperactivity we are dealing with. The therapy must be individually tailored to the needs of the child and its character. There are some of the most popular methods used to treat ADHD:

- supporting personality adolescence, classifying attitudes towards oneself and others, e.g. holding, which consists in the possibility of manifesting internal aggression by the child while keeping him/her in direct physical contact,
- therapies controlling motor activity and improving the ability to focus attention, such as: music therapy, sensory integration, motor therapy (V. Sherborne), relaxation,
- pharmacotherapy [2, 13, 14].

Depending on the domination of a given type of hyperactivity syndrome, we use specific forms of assistance:

a) in case of hyperactivity: counselling teachers and parents, teaching the child proper reactions to stimuli coming from the environment, change of environment elements, pharmacotherapy,

b) lack of attention: pharmacotherapy, learning to focus attention, cognitive function exercises,

c) aggression and impulsiveness: teaching the child how to react properly to external stimuli, family therapy, individual counselling, pharmacotherapy,

d) difficulties at school: individual counseling, re-education, compensatory and compensatory teaching [2, 13, 14].

Conclusion:

Motor hyperexcitability syndrome with attention deficit disorders affects boys to a large extent, which may be related to the fact that girls carry the gene responsible for the manifestation of the disease. The clear cause of hyperactivity syndrome in children is elusive because many factors may influence the manifestation of the disorder. Therefore, the treatment should be adapted to the type of problem and the individual needs of the young patient.

REFERENCES:

1. Szczucka J., „Nadpobudliwość psychoruchowa u dzieci – symptomy oraz postępowanie",OPERON, Warszawa, 2006r
2. Benzing V., Schmidt M. „Cognitively and physically demanding exergaming to improve executive functions of children with attention deficit hyperactivity disorder: a randomised clinical trial" ,BMC Pediatr. 2017
3. Ping-Tao Tseng Yu-Shian Cheng, Cheng-Fang Yen, Yen-Wen Chen, Brendon Stubbs and others „Peripheral iron levels in children with attention-deficit hyperactivity disorder: a systematic review and meta-analysis", Scientific Reports, 2018; 8:788
4. Januszewska E., Januszewski A. „Nadpobudliwość psychoruchowa – kryteria diagnostyczne, przebieg i trudności na różnych etapach rozwoju", Rocznik Filozoficzny Ignatianum XXII/ 2 (2016), s. 28-51
5. Krempińska I. „Zespół nadpobudliwości psychoruchowej z deficytem uwagi (ADHD) w ujęciu neurokognitywistycznym i pedagogicznym" Neurokognitywistyka w patologii i zdrowiu, 2009-2011, Pomorski Uniwersytet Medyczny w Szczecinie, s. 72-80
6. Memarmoghaddam M., HT Torbati HT., Sohrabi M., Mashhadi A. and Kashi A. „Effects of a selected exercise programon executive function of children with attention deficit hyperactivity dis order", J Med. Life. 2016 Oct-Dec; 9(4): 373-379
7. Giertuga K.A., Cybulska-Kłosowicz A. „Neuroanatomiczne i funkcjonalne korelaty zespołu nadpobudliwości psychoruchowej z deficytem koncentracji uwagi w świetle dwóch modeli rozwojowych: zaburzonego i opóźnionego procesu dojrzewania mózgu", Neuropsychiatria i Neuropsychologia, 2014
8. Gorzkowska I., Samochowiec J. „Historia zaburzenia hiperkinetycznego (ADHD) a świecie i w Polsce przed ICD-10 i DSM IV-TR", Psychiatria, tom 9, nr3, 91-99
9. Skibska J. „Dziecko z nadpobudliwością psychoruchową i deficytem uwagi – najważniejsze problemy oraz sposoby postępowania", Oficyna Wydawnicza Impuls, 2013

10. Figure 1: https://www.welcomecure.com/diseases/adhd/symptoms - 05.05.2019r. - download date

11. Wiśniewska B., Wendorff J. „The state of diagnostication of neurodevelopmental disorders coexisting with ADHD in children and adolescents – own studies", Neurol Dziec 2008; 17, 33: 23-30

12. Kowolik P. „Nadpobudliwość psychoruchowa dzieci w młodszym wieku szkolnym: wprowadzenie do tematu", Nauczyciel i Szkoła 2005, 1-2 (26-27), 9-24

13. Fibert P., Peasgood T., Relton C. „Rethinking ADHD intervention trials: feasibility testing of two treatments and a methodology", European Journal of Pediatrics 2019

14. Kruk A., Brukwicka I., Kopiański Z., i inni. „ADHD – atmosfera terapeutyczna", Journal of Clinical Healthcare 1/2016, 26-31