

The Importance Of Physical Activity In Children With ADHD

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Abstract—ADHD is one of the main neuropsychiatric disorders in developmental age: in America it has been estimated that about 5% of the child population is affected (APA, 2013-American Psychiatric Association). The disease is identified during the years of elementary school in which the deficiencies become factors that hinder the learning processes. The symptomatological picture presents a pathognomic pattern of the pathology, characterized by a deficit of attention, hyperactivity and impulsivity. In preschool age, the main manifestation is hyperactivity, followed, during the elementary school period, by a more prominent symptom of inattention, while in the adolescent phase the signs of hyperactivity occur less frequently and may be limited to agitation or an inner feeling of nervousness, restlessness or impatience. In adulthood, however, impulsiveness together with inattention and restlessness can remain at problematic levels even though hyperactivity has decreased. However, neuropsychological deficits reflect only the predominant part of the pathology. ADHD subjects present in the social sphere an inadequate or changing way of applying themselves in tasks that require sustained effort, often interpreted by others as laziness, irresponsibility or lack of collaboration. Family relationships can be characterized by discord and negative intentions, while relationships with peers are frequently altered by prejudice, rejection and derision. There are serious deficiencies at the school level, such as dyslexia, dysorthography and dyscalculia, as well as a reduced IQ, in classroom and social behaviors, which are detected with slight delays in language and motor and social development

Keywords—*physical education, ADHD, developmental age, sport, re-education.*

Introduction

ADHD (attention deficit hyperactivity disorder) or, in Italian DDAI (attention deficit hyperactivity disorder), represents a neuro-biological condition that begins in childhood. This condition is characterized by an inadequate level of attention, concentration, impulsiveness and motor activity, to the point of making it difficult and, in some cases, preclude the normal development, integration and social adaptation of the child. In fact, the heterochrony that is evident is perpetuated in various contexts: domestic, school, sports, musical . accentuating the deficiencies of the disease. The latter, as a rule, is found more frequently in the male gender, with a male / female ratio of 2: 1 in

children and 1.6: 1 in adults, however girls show more markedly the characteristics of the pattern of carelessness. Erroneously, the disorder was considered exclusive to childhood, with a descending course in adolescence that did not affect the mental health of adults. However, various researches confirm the persistence of ADHD in 30-70% of subjects affected by it, with serious psychological consequences that can lead to asocial behaviors or occur in conjunction with Oppositional Provocative Disorder, Conduct Disorder or Antisocial Personality Disorder. , with consequent risk for substance use disorders and the development of relevant psychosocial pathologies. Psychopathological gnoseology investigates the theories of typical development, generating the frames of reference for understanding the evolution of risk and psychopathologies. Despite this, diagnostic certainty falters and the dividing line between pathology and normality becomes increasingly thin, even in the face of the instability of the period of onset, marked by both psychological and physical changes. Indeed, the request for specialist consultation occurs late, when by now the behavioral problems have already influenced the global and adaptive functioning of the minor in the various life situations. The clinician, therefore, must take into consideration a series of predisposing factors, including the interpersonal and intrapsychic aspects of the subject (behaviors, interactions, contexts, representations, relationships) in contact with the reference system of the figures significant (parental-family figures) and with the extended system (society, culture), both from the point of view of normal development and dysfunctionality. Furthermore, with the recent release of the fifth edition of the DSM - V (Diagnostic and Statistical Manual of Mental Disorders), ADHD has been included in the section dedicated to neurodevelopmental disorders, a set of very early onset manifestations, generally found in preschool age and characterized by a developmental deficit that leads to a significant impairment of personal, social and scholastic functioning. The inclusion of ADHD in this diagnostic classification has allowed the establishment of evaluation criteria for an earlier identification of cases and consequently of their treatment. Generally, the intervention involves a combination of drugs in association with psychotherapy (multimodal treatment) or only the psychotherapeutic method, however in both cases there is no eradication of the etiological factor, but only an exclusive improvement of the main and characterizing manifestations. the dysfunction. The symptoms can also be mitigated by the participation of these subjects in sports or psychomotor activities,

useful for the acquisition of skills and for the development of behavioral patterns that are more compliant and close to the normal threshold. We therefore understand the extreme importance of early intervention, which includes parent training services in correlation with the services provided by schools, in order to recognize and take charge of situations at psychopathological risk, avoiding that they evolve irreversibly over time.

ADHD is one of the main neuropsychiatric disorders in developmental age: in America it has been estimated that about 5% of the child population is affected (APA, 2013-American Psychiatric Association-). This affection is generally identified in the course of the elementary school years in which the deficiencies become obstacles to the learning processes. The symptomatological picture presents a pathognomic pattern of the pathology, characterized by a attention deficit, hyperactivity and impulsivity. As a rule, in preschool age, the main manifestation is hyperactivity, followed, during the elementary school period, by a more prominent symptom of inattention, while in the adolescent phase the signs of hyperactivity occur less frequently and may be limited. agitation or an inner feeling of nervousness, restlessness or impatience. In adulthood, however, impulsiveness together with inattention and restlessness can remain at problematic levels even though hyperactivity has decreased. Inattention manifests itself at a behavioral level as a diversion from the task, lack of perseverance, difficulty in maintaining focus, both focal and stable, and disorganization (not caused by a defiant attitude or lack of understanding). Hyperactivity, on the other hand, manifests itself with excessive motor activity at inopportune moments, or with excessive struggling with drumming or talkativeness. Ultimately, impulsiveness refers to hasty actions that occur instantly, without premeditation, and which could have a high potential for harm to the individual. Such behaviors can manifest themselves as: social intrusiveness, making important decisions without considering the long-term consequences, having a desire for immediate reward or an inability to delay gratification. However, neuropsychological deficits reflect only the predominant part of the pathology. In fact, people with ADHD have an inadequate or changing way of applying themselves in the social sphere in tasks that require sustained effort, often interpreted by others as laziness, irresponsibility or lack of collaboration. Family relationships can be characterized by discord and negative intentions, while relationships with peers are frequently altered by prejudice, rejection or characterized by mocking behaviors. Finally, there are serious deficiencies at the school level, such as dyslexia, dysorthography and dyscalculia, as well as a reduced IQ, a deficit in academic performance, in classroom behavior and social behavior, which are usually detected together with slight delays in language and motor and social development. It is therefore assumed that the dysfunctional and pervasive aspects in various life

situations (family, school, social context, sports context, etc.) must be of such gravity as to determine a considerable interference on global functioning, as well as present themselves with a certain degree of frequency and persistence, in order to make a correct diagnosis. From the point of view of etiopathogenesis, the causes of the onset of ADHD have not been identified, even in the face of the scarce scientific contribution resulting from the difficulty of finding all the factors that could interfere with the development of the deficit. Despite this, many scholars have worked hard to search for the etiological agent, and with the growing interest various hypotheses have developed. A scientific study, in defining Attention Deficit and Hyperactivity as a result of a genetic cause, considered pairs of homozygous and dizygotic twins. In homozygous twins, being carriers of the same genetic makeup, any behavioral difference could be attributed to the shared and unshared environment, while the dizygotic siblings had similarities in genetic makeup as if they were two non-twin siblings. It has therefore been observed that the homozygous twin brother of a child with ADHD has an 80% probability of presenting the same disorder, while in dizygotes the percentage drops to 30-35%, refuting the initial thesis. However, much of the scientific pattern agrees on the importance of alterations in the dopaminergic system in the pathogenesis of ADHD. It has been shown that subjects with ADHD have a variant of the gene (SLC6A3) encoding the carrier responsible for the reuptake of dopamine which causes hyperfunction of the same carrier. Furthermore, in affected subjects it is possible to find a variant of the gene for dopaminergic receptors D2 and D4 that is particularly abundant, whose gene polymorphism would be at the basis of the clinical variants of ADHD. These evidences suggest that in affected subjects there is insufficient dopaminergic transmission, which on a clinical level is expressed as an inability in the processing of environmental stimuli, in the programming of the motor and behavioral repertoire and in the ability to self-control. In fact, the lower dopamine levels in children with ADHD appear to be attributable to the speed with which their neurons capture dopamine present in the synaptic space. Furthermore, recent studies using non invasive techniques, such as Nuclear Magnetic Resonance (MRI) techniques, have shown volumetric changes in areas predisposed to inhibition and self-control, i.e. volume reductions in the dorsolateral prefrontal cortex, of the two nuclei of the base, caudate nucleus and pale globe, and cerebellar worm in about 4% of ADHD subjects compared to control groups (not affected by the disease). These differences are more evident in the right hemisphere, and appear statistically significantly correlated to alterations in the ability to inhibit the motor response to environmental stimuli. It emerged, in fact, that the malfunctions of the dorsolateral prefrontal cortex cause deficits in the processes of working memory, in the planning of behavior, in the resistance to distractions and in the development of the feeling of

self-awareness. The malfunction of the nuclei of the base and of the areas interconnected with the central regions lead to poor control of responses and monitoring of purpose-oriented actions, thus generating impulsive reactions on the part of the subject. The limbic structures, on the other hand, seem to play a role in the genesis of the disorder, especially the hippocampus which is involved in attentional processes through visual-spatial working memory and in the processes of modulation of executive functions. Finally, the caudate nucleus and the globus pallidus are fundamental in the coordination of impulses of cortical origin which, by interrupting the automatic responses, would interfere with the main action. Among the non-genetic factors linked to ADHD are identified: prematurity, the use of drugs, alcohol and tobacco by the mother, exposure to neurotoxins (eg. lead), infections (eg. encephalitis) and the family environment. From a diagnostic point of view, the presence of these manifestations sometimes appear misleading, precisely because of their natural similarity to the behavioral characteristics typical of childhood, which confines them to the limits of normality, making it difficult to ascertain. To untangle the fine line, the DSM-V outlines some criteria for the assessment and certification of the presence of ADHD in the subject under examination.

Method

The criteria refer to five main groups:

A. - A persistent pattern of inattention (A1) and / or hyperactivity-impulsivity (A2), which interferes with functioning or development. Both patterns are characterized by six or more symptoms, which must persist for at least 6 months with an intensity incompatible with the typical level of development and with a negative impact on social, school and work activities;

B. - Several symptoms of inattention or hyperactivity-impulsivity that occur before the age of 12;

C. - Different symptoms of inattention or hyperactivity-impulsivity that occur in two or more contexts (eg, at home, at school or at work; with friends or relatives; in other activities);

D. - There is clear evidence that symptoms interfere with, or reduce, the quality of social, school or occupational functioning;

E. - Symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, Personality, substance intoxication or withdrawal).

At this point, a further evaluation will have to be carried out to classify the disorder into:

- Combined manifestation: If Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are both met in the last 6 months.

- Manifestation with predominant inattention: If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met in the last 6 months.

- Manifestation with predominant hyperactivity / impulsivity: If Criterion A2 (hyperactivity-impulsivity) is met and Criterion A1 (inattention) is not met in the last 6 months.

Finally, specify the current severity:

Mild: There are few symptoms other than those required to make the diagnosis, and symptoms involve only minor impairments in social or occupational functioning.

Moderate: Symptoms or functional impairment ranging from "mild" to "severe" are present.

Severe: There are many symptoms other than those required to make the diagnosis, or several symptoms that are particularly severe, or the symptoms involve marked impairment in social or occupational functioning.

The definitive diagnosis will therefore be formulated on the basis of behavioral criteria, verifying whether they characterize the child's way of being even in contexts of habitual life (at home, at school, etc.). Specifically, the symptoms must be inadequate with respect to the individual's level of development, present before 12 years of age, last at least six months, be pervasive in at least two contexts of the individual's life (school, family, etc.) and cause significant impairment in social, academic or occupational functioning.

Results

When the pathology is declared, the single case must be analyzed, since each subject will have its own developmental and behavioral characteristics, which must be treated with individual strategies. Therapy, therefore, will have to be molded directly on the child, and will have to be undertaken in a timely manner, that is in the stages of development, in which behavioral models and the corresponding cognitive and emotional regulation styles will be more easily correctable. The treatment consists of various options: psycho-behavioral therapy, drug therapy and multimodal therapy, in combination with interventions such as parent training, school support and finally physical activity. The psycho-behavioral intervention is carried out through personalized sessions, which will be characterized by techniques and exercises aimed at acquiring self-control skills, immediate response to external stimuli and problem-solving exercises. The child will be allowed to overcome the difficulties of concentration, to achieve the set goals, not to be distracted by his surroundings, to improve his self-esteem and to encourage the repetition of correct

behaviors, through the use of prizes. Generally, this treatment is associated with the intake of psychostimulants, considered the most effective drugs for individuals with ADHD, of which the most commonly used are methylphenidate (Ritalin), amphetamines (Adderal), dextrostat, Dexedrine and atomoxetine (Strattera). The main positive effects are related to the maintenance of attention levels, impulsivity and hyperactivity, however, in order for there to be lasting improvements over time, it is essential to combine pharmacological treatment with a combined path to cognitive and behavioral strategies, which will improve self-esteem, socio-relational skills and learning difficulties school. In recent years, in fact, the use of a multimodal approach has spread, characterized by the integration of several cognitive, psychological and pharmacological interventions, which are implemented at the individual, family, school and socio-environmental level, certainly proving to be the most effective. However, problems can be encountered during the implementation of the methodologies, deriving from the large number of individuals involved. However, the main objective will be to reduce dysfunctional behaviors and prevent the appearance of antisocial attitudes, planning interventions that have positive repercussions in the different life contexts of the child (school, family, social environment), also acting with cognitive behavioral techniques that they provide parallel sessions for parents and children, which are very effective in reducing aggression. In this regard, "parent training" is fundamental, a model that provides for the active involvement of the parental couple, focusing on the need to intervene directly within the family unit, involving parents by analyzing the child's behavior. This methodology is a structured and manualized form of intervention, which takes place in a group setting, allowing parents to share their experience with other families and to take note of the situation in which they find themselves. Therefore, the objective will not only be to increase the parent's skills in the daily educational management of the child, but also to decrease the level of parental and family stress and to expand parenting skills in solving problems; allowing them to feel less alone and to see their condition less unique and, above all, modifiable. In the school environment, the presence of a child affected by ADHD among their students entails an in-depth study of the pathology as well as of the intervention strategies, both from the point of view of preparatory learning and the methods of integration and inclusion of the subject in the class, which sometimes appears reluctant. From this point of view, the most frequently encountered problems concern the management and organization of lessons, in addition to the persistent feeling of anxiety linked above all to aggressive manifestations, the first factor related to damage to classmates. It is therefore necessary to work with teachers so that they can master behavioral strategies suitable for controlling the behavior of the child. Furthermore, evidence-based interventions, both of a behavioral and pharmacological type, are effective.

Both these interventions, as well as their combination, have been shown to have good efficacy in the management of hyperactive, inattentive and impulsive symptoms, however they have some limitations (side effects, poor compliance with treatment, prolonged duration, etc.) and require integration with complementary activities. Among the latter, an important role is played by physical activity, where the playful environment favors the integration and collaboration of children, increasing self-esteem and motivation, facilitating learning and development of functional skills. In addition, the characteristics of sporting activity support self-regulation, attention, motor coordination and social skills, through the need for constant training, respect for shifts, collaboration with other players and management of frustration. Generally, it would be more appropriate to prefer those sports, individual or group, in which the rules are very simple, the space is well defined, the game schemes are not continuously modified, based on the agreement between the players, and finally success is not primarily measured on the basis of skills. It might be useful to focus on disciplines that involve constant movement, such as football or rugby, while to avoid sports that are very chaotic or in which it is difficult to decode the surrounding context to implement the expected behavior and, in which moments of inactivity perhaps associated with concentration are necessary, such as baseball. Instead, individual sports, for example swimming or the gym, are a good choice, as the child must keep attention exclusively on himself without concentrating on memorizing strategic schemes. Finally, another possibility is martial arts, a sport loved by many children with ADHD, whose choice is often influenced by the fear of inducing aggressive and dangerous behaviors, despite the fact that teachers and practitioners of these disciplines have acquired the perfect psycho-balance. The choice of sporting activity should be up to the child, in order to motivate motivation and consequently his desire to participate, which will allow him to induce a feeling of well-being. In doing so, a child with ADHD will feel more competent and appreciated, since some typical aspects of the disorder such as impulsivity, hyperactivity and motor restlessness may appear less evident, which, unlike the context, can take on connotations negative, as in the case of the school environment. However, not all sports are suitable for children with ADHD, industry experts recommend swimming and martial arts first and foremost, which are the two sports in which more scientific evidence has emerged, but also tennis, horse riding, climbing, fencing and others. activities aimed at promoting health, self-esteem and teamwork. Among the most suitable and chosen activities by these children are:

1. Swimming: This activity represents the ideal sport for children with ADHD who excel in structured and guided activities. Furthermore, despite being an individual sport, swimming can provide these children with the opportunity to exercise physical activity in a group context. The child will therefore be able to

concentrate both on a personal level by improving, for example, swimming times (without any direct comparison with the other members of the team), and on a social level by developing communication and social skills.

2. Martial Arts: Self-control, discipline and respect are just some of the skills emphasized in martial arts lessons. The boys who practice this activity must perform the techniques that the teacher proposes step by step, leaving few opportunities for distraction. Furthermore, a surprising advantage of martial arts is given by the use of rituals (such as bowing to the teacher) which can help these children to develop a series of routines in other areas of their life;

3. Tennis: For individualistic children who love to compete, tennis is certainly the ideal sport. This activity also requires features that help children with ADHD a lot, for example the fast pace, which maintains sustained concentration, or hitting the tennis ball which can be a functional gesture to get rid of the anger or frustration generated by a day. challenging at school;

4. Climbing: For children with predominant hyperactivity / impulsivity, it may be the right sport. Climbing is a very intuitive sport, with simple rules (climbing walls), which requires a good degree of planning (problem solving), attentional-motor self-regulation and coordination. All these cognitive and neuropsychological functions can be trained, in a fun way, by practicing this discipline;

5. Basket: it is very suitable for school-age children with ADHD because it allows them to teach them respect for the turn, motor coordination, planning, all elements necessary to score the basket and get the point. In addition, basketball is a group sport that maintains a certain individuality and this allows these children to explore the environment, discharge their energy by running on the court and train their attention with respect to the mobility of the ball;

6. Gymnastics: Activities that require particular attention to body movements can help improve concentration. In fact, gymnastic equipment and movements are very similar to those used during psychomotor sessions, and can help both to reduce the disturbance of sensory processing and to enhance the strength, balance and muscle awareness of the child with ADHD;

7. Wrestling: some children with ADHD demonstrate seemingly unlimited energy and a difficulty in controlling and managing emotions (especially anger). Wrestling can be a fun and safe activity, to channel these emotions in a positive way;

8. Soccer: For children who work on social skills, being part of a soccer team could be the right sport. In fact, the idea of having to jointly achieve a goal allows you to work as a team and consequently acts as a positive reinforcement on self-esteem and the perception of self-efficacy. In addition, the constant

action of football games is ideal for holding shorts periods of attention and to download the

physical tension;

9. Horse riding: this sport is suitable for those who love nature and animals. For children who show excessive hyperactivity, the open space allows symptoms to be manifested in a more functional and context-compatible way. Furthermore, the natural environment has a calming effect, and allows you to avoid the sensory load; for this reason, horse riding is also suitable for children who present

a comorbid anxious symptomatology;

10. Cross-country skiing: unlike other sports, where children wait before starting the activity, and this could cause behavioral problems caused by boredom, cross-country skiing has no break times. It is also a very peculiar sport, which is practiced only in certain contexts, encouraging the commitment to maintain high levels of motivation during its practice;

11. Athletics (running): ideal sport for developing concentration. Running teaches children rhythm and discipline, develops motor planning, strategy, and fine and coarse physical coordination skills. However, it is advisable to plan the competitive activity very carefully, especially for those children who have low levels of frustration tolerance, during competitions. In fact, competitions can sharpen the

tension and competitiveness and children can easily get discouraged;

12. Archery: this sport, although apparently dangerous as the weapon is sharp and sharp, can have great benefits for the child with ADHD if it is carefully monitored and guided. In fact, it teaches responsibility by improving concentration, attention and self-confidence;

13. Fencing: for children with metacognitive difficulties, this sport has important positive implications, as it strengthens the perception of the other, teaches to read the opponent's movements, to understand moods, to distinguish potentially threatening movements, to enhance strategy and problem solving skills. In theory it is classified as an individual sport, but in reality both the fighting methods, with the opponent a few meters away, and those of structuring the activity make it in effect a socio-relational sport that enhances the capacity for inclusion. interpersonal.

Discussion

Coordination skills can be general and special and precisely the latter contribute to the execution of each single gesture. These are: the ability to mate and combination, differentiation, orientation,

mo, of reaction, of motor fantasy and balance. the research was based on coordination (the ability to know how to organize, regulate and control the movement of the body in space and in

time to reach a goal.) a improvement of those who have practiced these sports has been noticed

in the frequency and number of fast corrected sequences spontaneous city. Precisely in the latter at speed- maximum, the children got the better of it on that control in the post: this could have been due to the intervention done focused on full coordination. From the results it is therefore clear that there was a positive figure and this result is really a improvement in motor performance in DSA. Motor activity shows signs of progressive but not regressive improvement.

On a motor level, it is also useful to advise the child to use the so-called "anti-stress", or objects that he can use to release tension and channel hyperactivity, for example: balls to squeeze, elastic bands to stretch, key rings to rotate. To facilitate these processes, small motor exercises such as lifting your hands from the chair for a set time, pressing your hands against each other for a few seconds can also help; or alternatively, to promote self-control techniques and cognitive procedures useful for dealing with the problems that arise in daily life.

Conclusion

Given the premises set out, we can say that physical activity is the optimum for hyperactive children, therefore it must be welcomed and managed by parents with enthusiasm and awareness as, if associated with rehabilitation treatment, it allows to obtain significant results both from a physical and psychic point of view.

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