

ANALYSIS OF THE MAIN ADHD DIAGNOSIS VARIABLES FOR CHILDREN BETWEEN 6-12 YEARS OF AGE

Silvia López Alonso

Grado en Psicología

Investigadora predoctoral de la Universidad de Valencia.

Dpto. de Psicogerontología: perspectiva del Ciclo Vital

masiloa@alumni.uv.es

Recepción Artículo: 9 octubre 2020

Admisión Evaluación: 11 octubre 2020

Informe Evaluador 1: 15 octubre 2020

Informe Evaluador 2: 16 octubre 2020

Aprobación Publicación: 27 noviembre 2020

ABSTRACT

Schooling allows identifying potential developmental shortages in children, as they get compared to their peers. Some may find it hard to stay still and focus on the task at hand, show inadequate levels of hyperactivity and impulsiveness that may even interfere with the development of the normal functioning and academic results. How can we find out if these behaviours are typical of the natural and biological development of children, the result of a learning difficulty or disorder, or an indication of an Attention Deficit Hyperactivity Disorder (ADHD)?

Objective: To analyse the different standard procedure protocols to assess and diagnose ADHD in children between 6-12 years of age. **Method:** Systematic review of the different types of assessment used to diagnose ADHD among this population group. **Results:** It has been noticed that ADHD is a chronic, neurobiological disorder with a high co-morbidity. The diagnosis, exclusively clinical, must consider the wider clinical history of the children to (a) assess the personal, family and school background; (b) complete a mental, physical and neurological examination; (c) confirm the differential diagnose, and (d) use the diagnose criteria of DSM 5 and CIE-11-EMM. **Conclusions:** The items that should be included in the assessment completed to diagnose the ADHD are proposed.

Keywords: ADHD; assessment; diagnosing; biopsychosocial approach; parenting Style

RESUMEN

Análisis de las principales variables de diagnóstico del TDAH en niños de 6 a 12 años. La escolarización permite identificar posibles carencias de desarrollo en los niños, ya que se comparan con sus compañeros. Algunos pueden tener dificultades para permanecer quietos y resultados académicos. ¿Cómo podemos averiguar si estos comportamientos son típicos del desarrollo natural y biológico de los niños, el resultado de una dificultad o trastorno de aprendizaje, o un indicio de un Trastorno por Déficit de Atención e Hiperactividad (TDAH)? **Objetivo:** Analizar los diferentes protocolos de procedimiento estándar para evaluar y diagnosticar el

ANALYSIS OF THE MAIN ADHD DIAGNOSIS VARIABLES FOR CHILDREN BETWEEN 6-12 YEARS OF AGE

TDAH en niños de 6 a 12 años. **Método:** Revisión sistemática de los diferentes tipos de evaluación utilizados para diagnosticar el TDAH en este grupo de población. **Resultados:** Se ha constatado que el TDAH es un trastorno crónico, neurobiológico y con una alta comorbilidad. El diagnóstico, exclusivamente clínico, debe considerar la historia clínica más amplia de los niños para (a) valorar los antecedentes personales, familiares y escolares; (b) completar una exploración mental, física y neurológica; (c) confirmar el diagnóstico diferencial, y (d) utilizar los criterios diagnósticos del DSM 5 y CIE-11- EMM. **Conclusiones:** Se proponen los ítems que deben incluirse en la evaluación realizada para diagnosticar el TDAH.

Palabras claves: TDAH; evaluación; diagnóstico; enfoque biopsicosocial; estilo de crianza

INTRODUCTION

Schooling allows identifying behavioural, emotional, intellectual and language deficiencies (Franke et al., 2018) in children, as they are compared to their peers; it becomes possible to notice if they are in the correct biological development stage corresponding to their life cycle. Even as babies, humans display a huge curiosity for everything around them and learn quickly. This behaviour favours a gradual development of their affective, cognitive and social functions. During the first schooling stage, social relationships go beyond the family environment and allow them to relate to other children and teachers. At school they learn new things such as reading, writing and maths. This allows enriching their personal and social world, developing their potential (character, independence, own ideas, being responsible). These are personal experiences of the child and they are not void of disorganised emotional states, such as impatience, restlessness, fear, surprise, happiness or sadness. On occasions, they may get out of control and become hysteria, hyperactivity, lack of attention, alienation, phobias or depression. Later on, the pre-teen years will bring new physiological and mental alterations caused by the hormonal awakening. Manifestations of high, low or no self-awareness, anger, fear, anxiety or sadness are common at this stage.

All these alterations and changes, together with the adaptive processes, result in children experiencing difficulties to focus, remain still and focus on the task at hand in varying degrees. This is a temporary behaviour that does not appear repetitively, and it is considered within the normal boundaries of a child's development. And, unless there is a clear difficulty, it typically goes hand in hand with mood swings that, between ages 6-12, can be very frequent. Conversely, those suffering from an Attention Deficit Hyperactivity Disorder (ADHD) display these difficulties in a continuous way and for no apparent reason. A much more severe persistent and inappropriate pattern of inattention, impulsivity, and hyperactivity (Valverde & Inchauspe, 2014), appears more insistently than is generally observed in other children at the same stage of development and school level not suffering this condition. This may reach levels such that there is an interference in the development of their normal functioning, consequently affecting their academic performance (Carlson, 2014; Franke et al., 2018; García, Grau & Garcés, 2014; Peasgood et al., 2016; Sloan et al., 2019). How to assess if a behaviour involving restlessness, anxiety or inattention, is typical of the biological and natural development of the child, of a learning difficulty or disorder, or of an attention deficit hyperactivity disorder (ADHD)?

ADHD is becoming one of the most common childhood disorders with symptoms that have a negative impact on the child's normal functioning. It is a chronic neurological disorder, with high comorbidity, genetically based and therefore inheritable. The lack of attention, hyperactivity and impulsiveness are symptoms that characterise the disorder itself, and they generally arise in early childhood and cannot be better explained by any relevant neurological deficiency or other sensory, motor, speech, or mental disabilities or serious emotional disorders (Molina & Musich, 2016). The child with ADHD presents various serious complications, a. In executive functions and cognitive behaviours such as deficiencies in activation, sustained attention tasks, motivation/reward imbalance, executive dysfunction or functional alterations. Barkley defines them as "behaviours related to a difficulty in following rule-abiding behaviours (RGB)" (Barkley en Fernandes, Piñón & Vázquez-Justo, 2017, p. 3). And b. "Structural functions of the prefrontal cortex, its connections with the *striatum* and cerebellum and imbalance of the dopaminergic and noradrenergic systems" (Lopez, Rodillo & Kleinsteuber en Fernandes et al., 2017, p. 3; Vázquez-Justo, Piñón & Fernandes, 2017b).

Family and social factors

There is an increasing tendency to take into account the psychosocial factors related to the child with ADHD, since the child suffering this disorder generates a complex social context in which the family has a relevant role in the manifestation of symptoms. Studies show how the behaviour of the child with ADHD is directly related to the parenting styles received and, when family relationships are not the cause of ADHD, they can favour the persistence and severity of the symptoms. On the other hand, the family, especially parents, can and should act as protective factors for these children, helping them to create environments conducive to face the difficulties of the disorder, as well as to build up natural strengths. (Lazaratou & Golse, 2018; Molina & Musich, 2016).

Gender as an ADHD variable

The gender variable seems relevant, since it is proven that girls are less likely than boys to suffer from this disorder in a ratio of 1 to 2-9. Boys show more impulsive and aggressive symptoms than girls, who are tend to display an inattention and cognitive difficulties (Piñón et al., 2017a). It is expected that more than 80% of children with ADHD will continue to manifest this disorder during adolescence, and 30-65% also into adulthood (Barkeley en Piñón et al., 2017a, p. 10). In a study of 12-year-old boys, girls with high ADHD had more diffuse cognitive deficits than their low-ADHD peers. Boys and girls with high ADHD showed primarily sleeping difficulties and problems to exteriorize and/or express feelings compared to those with low ADHD (Arnett, McDonald & Pennington, 2013).

Biochemical origin of ADHD

Another study conducted with children ages 7-13 with ADHD and a control group of the same age, provided new insight into the independent effects of a wide variety of neuropsychological deficits and revealed the importance of emotional and executive functional deficits as elements that must be integrated as an essential part of ADHD. Since the results of this study showed that the variability of reaction times, and the executive and emotional functioning turned out to be the factors that independently contributed to distinguish between children with ADHD and those in the control group. In view of which, the authors emphasize the neuropsychological heterogeneity of ADHD and highlight the need to better understand the role of emotional regulation at a theoretical and clinical level for this disorder (Sjo"wall et al., 2013).

There is a great consensus in defending that one of the main causes of symptoms in this disorder is the presence of alterations in the biochemical pathways. These are areas of the limbic system, the frontal cortex, the basal ganglia, and the reticular activation system; each system has its own neurotransmitter and interacts with other systems, leading to a complex brain system. Thinking about what is real and possible, establishing hypotheses, deductively inferring and connecting emotions and logic (Delgado, 2014; Silver, 2004). A deficiency in any of the neurotransmitters described within the brain system could lead to hyperactivity, inattention and/or impulsivity (Lecei et al., 2019; Silver, 2004; Von Rhein et al., 2015).

ETIOLOGY OF ADHD

It is widely accepted that ADHD is chronic, heterogeneous and of a neurobiochemical origin, and that its special characteristics are inattention, hyperactivity, and impulsivity (Sancho, 2017). It is a complicated model because it includes parallel and interconnected neurocerebral pathways in its etiology and pathology (Lecei et al., 2019; Silver, 2004; Von Rhein et al., 2015) with a model repeated and observed in the ADHD child. There are also certain features in the child that increase the probability of a disorder comorbid to ADHD. 1. For patients: specific learning or reading-writing disorders, low cultural and educational level or low IQ. 2. For the ADHD: early onset, severe, combined subtype, with aggressiveness, of long evolution. 3. Family history: parents with ADHD, stress, depression, bipolar disorder. 4. Pregnancy: low weight at birth, accident, substance, alcohol and tobacco use during pregnancy (Engel, 2012; Franke et al., 2018; IACS, 2017; Piñón et al., 2017b; Silver, 2004; Vázquez-Justo et al., 2017a).

Although the main cause of ADHD is organic, namely "a chemical imbalance in the brain areas involved in attention and movement, as well as deficits in the process of dopamine transmission" (López et al., 2013, p. 73),

ANALYSIS OF THE MAIN ADHD DIAGNOSIS VARIABLES FOR CHILDREN BETWEEN 6-12 YEARS OF AGE

its genetic nature is hereditary and socio-environmental factors could aggravate the prognosis of the disorder in addition to increasing related disorders. Silver states that the genetic code is responsible for at least 50% of those with neurological disorders (Silver, 2004). While Carlson explains that there is firm evidence that estimates the probability of inheriting ADHD between 75 and 91% (Thapar et al., en Carlson, 2014, p. 642).

Thus, children from parents with ADHD have a higher risk index for a more severe clinical manifestation of the disorder and higher rates of family conflict. Children with ADHD and more severe behaviour are more likely to have a parent with ADHD (Agha et al., 2013; Von Rhein et al., 2015). Consequently, optimizing parenting practices improves the child's behaviour at school and the student-teacher relationship (Mautone et al., 2012; Sloan et al., 2019; Vann den Hoofdakker et al., 2014). In all cases, it is important to be familiar with the symptoms of the disorder itself and the comorbid conditions it is associated with in order to identify the reason for the child's hyperactivity, inattention, and excessive impulsiveness with respect to his or her age and classroom peers. Especially when there is disorganized attachment (Reilly, Senior & Murtagh, 2015; Sloan et al., 2019; Whitea, Gibson & Wastell, 2019). Sollie, Morch & Larsson examined a sample of 214 children of 12-13 years of age, including healthy participants and others with ADHD, and assessed their symptoms, demographic variables, parents and family. Children with ADHD and oppositional and defiant disorder behaviours revealed that their parents experienced more parent and family dysfunction than children with ADHD alone. Parents of healthy children had significantly less parent and family dysfunction than those of children with ADHD. Partial correlations revealed a strong association between children with ADHD, parents, and family dysfunction. The study concluded that the high variety of stressors in parents and families of children with ADHD is relevant and parental factors should be taken into account in the evaluation for the diagnosis of ADHD, as well as being a prerequisite for subsequent treatment focused on the family (Lazaratou & Golse, 2018; Sloan et al., 2019; Sollie et al., 2016).

ADHD comorbidity

Piñón et al., stated that ADHD is a complex model because it contains parallel and interrelated pathophysiological pathways in the etiology and pathology of the disorder and these are repeated individually and in group observation of children affected. They defined this as "heterogeneity of the disorder" (2017b, p. 21). However, the cause of an increased likelihood of comorbid disorder occurring is due to the existence of interrelated pathophysiological brain pathways (Piñón et al., 2017b; Silver, 2004; Vázquez-Justo et al., 2017b). Among the most frequent comorbidities are anxiety, learning, emotional, personality, behavioural disorders, substance abuse, and others such as tics, oppositional-defiant, coordination and perception disorders, sleep disorders or autism (Piñón et al., 2017a). A study carried out in Sweden showed that 87% of children who met all the diagnostic criteria for ADHD had at least one comorbid diagnosis, and 67% had two (Jensen et al., en Piñón et al., 2017a).

In the same sense, both Autism Spectrum Disorder (ASD) and ADHD, frequently comorbid disorders, share an integral difficulty to recognise emotions. The study was carried out with a sample of children between 7-18 years old and showed that participants with ASD, ADHD, and ASD + ADHD performed worse than the control group in emotion recognition. Therefore, the authors proposed that, in a special way, the problems of emotion recognition and in general the problems of social cognition, are to be evaluated in clinical practice for ADHD (Waddington et al., 2018). Another study showed that psychosocial stress has a significantly more positive correlation with the hyperactivity and impulsivity dimension of ADHD, and that it is a mechanism particularly involved in this dimension. Therefore, stress should be considered independently from comorbid disorders associated with ADHD (Van der Meer et al., 2014).

The complexity of this disorder makes it necessary to insist on differential diagnosis to clear up any doubts because since ADHD has a neurochemical origin, "the underlying neurological problems are present from birth and behavioural patterns are chronic and generalized" (Silver, 2004, p. 13). It also drives its differentiation from specific and circumstantial disorders, such as other psychiatric disorders, somatic conditions and physiological states, the state of sleep deprivation during excessive exhaustion or bereavement (Engel, 2012). that share similar symptoms, but neither persist over time nor generalize because they are temporary in nature (Franke et al., 2018).

This is confirmed in the Chapter 6 of ICD-11 EMM, dedicated to *Mental, behavioural and neurodevelopmental disorders* which excludes *uncomplicated bereavement* (QE62) and the *reaction to acute stress* (QE84) which he defines as a set of transient symptoms of a somatic, cognitive or behavioural emotional type (CIE-11 EMM, 2018).

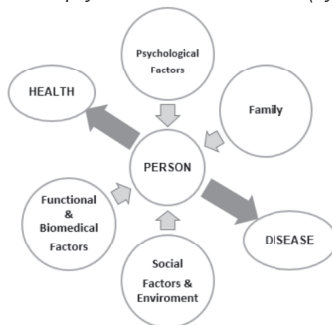
PHARMACOLOGY AND SIDE EFFECTS

The study by Flood et al. analysed the behaviour of children with ADHD and pharmacological treatment, parents and caregivers in 10 European countries. The results revealed that out of the 78% receiving a pharmacology, treatment, 23% had repeated a school year and 4% had recently been expelled from school. Between 68-88% of parents and caregivers reported that these children had difficulties with schoolwork, relationships and social and family activities (Flood et al., 2016; Trillingsgaard et al., 2014). *Side effects*: There are quite a few side effects and are generally dose-dependent, mild and transient. Gastrointestinal symptoms such as nausea, abdominal discomfort, or vomiting; anxiety, restlessness, nervousness; headaches; cardiovascular symptoms such as increased heart rate and blood pressure; insomnia; loss of appetite and weight; irritability; motor stereotypies and presence or worsening of tics. Feeling exhausted or excessively apathetic (Wolraich, McGuinn & Doffing en Sancho, 2017). and dependency (Lazaratou & Golse, 2018).

BIOPSYCHOSOCIAL APPROACH

The biomedical model poses some difficulties when explaining the different non-health care related variables that affect health, as it did not take into account the psychological and social aspects of the patient that seriously interfere and may even distort such variables. Faced with this, Engel argued that the need to conceptualize health and illness from a new perspective that takes into account all the processes involved to determine the illness, has been evident. Knowledge of the illness requires additional frameworks and concepts beyond the subject's biochemical processes (Lecei et al., 2019; Urchaga, 2017; Von Rhein et al., 2015) and clinical data the alone are not capable of explaining the illness in its entirety. And so, Engel proposed the biopsychosocial model that takes into account the patient and his condition. It is a scientifically sound approach to behavioural and psychosocial data, namely psychological and environmental factors without which it is difficult to really understand and monitor health and the condition. Determinants of the patient's life and life itself make up significant variables that influence the evolution of the illness. If these three variables (person, family and environment) are not taken into account, the reliability of the observations, the validity and the correlation will be defective. Ordinary pain, bereavement and melancholy are emotional states with very similar symptoms, just as diabetes and schizophrenia also have similar symptoms. But only a biopsychosocial or holistic approach can determine whether we are facing an emotional state, a disorder such as schizophrenia, or an illness such as diabetes. The patient and his symptoms or condition should not be a mere clinical history for the doctor (Figure 1), who should assess the relative contribution of the biological, psychological and social factors surrounding the patient and assume the commitment to cooperate in their own health care (Engel, 2012; Kaiser, 2017; Urchaga, 2017).

Figure 1. Biopsychosocial/Holistic model (by the author)



ADHD EVALUATION

When the child's development is not adequate, whether due to ADHD or for any other cause, this state will interfere with their performance and results at school, causing emotional and behavioural dysfunctions (Valverde & Inchauspe, 2014), and interpersonal relationship problems (Sloan et al., 2019) leading to school and family stress (García et al., 2014; Von Rhein et al., 2015). To determine whether there is a deficit or disorder, it is necessary to consider that: 1. Depending on age, a child is generally able to maintain sustained attention for 30-45 minutes. (Delgado, 2014) after this, the child feels restless and will hardly be able to continue paying attention and/or remaining in the same position, since it needs to move, speak or change tasks. But it probably will not do that without the teacher's indication. When there is an attention deficit, the child is not able to maintain the attention for longer than 20-25 minutes, and will immediately get up from the chair, with or without permission from the teacher. If the child is sitting at its desk at home doing homework, after this amount of time you will see him walking around the house, because he is unable to stay autonomously focused on homework any longer. And this will be repeated every day. The child will also show serious attention difficulties, generally speaking; when talking to him, he will seem to have its mind elsewhere, as if he is not listening (DSM 5, 2014). 2. ADHD is a disorder with a neurological root cause, the consequence of a neurochemical deficiency in specific areas of the brain that affects the prefrontal cortex, causing a cortical dysfunction. The cortex is extremely complicated because it performs numerous functions essential for the autonomous functioning of the individual, so ADHD will mainly affect basic motor, language, cognitive functions and organizational skills. 3. Evidence of a symptomatology including inattention, impulsiveness and hyperactivity, which are the three key symptoms that characterise ADHD (Hidalgo en Piñón et al., 2017a; Silver, 2004). Four. Because it is a disorder of neurological origin, it is found in the Diagnostic and Statistical Manual of Mental Disorders (DSM 5, 2014) of the American Psychiatric Association and in the ICD- CIE-11- EMM from the World Health Organization (WHO). 5. Learning disorder is the psychological disorder perhaps most frequently found in the continuum of associated cortical dysfunction disorders, such as language, motor, executive and organizational function disorders, anxiety states, moods, anger management, obsessive compulsive disorders, tics or ADHD (Franke et al., 2018; Silver, 2004; Von Rhein et al., 2015). 6. ADHD is also one of the disorders with the most associated comorbidity (Piñón et al., 2017b). It happens in such a way that, if the subject presents one of them, there is a 50% likelihood he will suffer from another one. 7. Between 30% -40% of students with ADHD also have learning disorders, therefore, when diagnosing, the presence of one or more associated disorders, such as motor tic disorder, Tourette's, anxious, obsessive-compulsive, anger disorders or mood control problems should be detected clinically (Silver, 2004). They must be identified and treated because ignoring them will only cause ADHD to greatly interfere in all aspects of the subject's life (Silver, 2004). This means that it will be necessary to find out what school or emotional problems are present, or if there are behavioural problems (Valverde & Inchauspe, 2014) manifested by the individual with classmates, at school and within the family, as well as looking for their real causes with the necessary instruments (García et al., 2014; Sloan et al., 2019). Eyrea et al., (2017) stated that irritability closely linked to ADHD and Disruptive Mood Disorder (in DSM5), are related in 91% of the cases to mood disorders like anxiety, depression, and a family background of depression. For the diagnosis of ADHD Arnett et al., (2013) propose to measure the child's internal symptoms, such as sleeping difficulties, social problems or cognitive and physiological performance. External ones, such as behavioural measures and how the child regulates his attention. And the importance of baseline evaluations taking into account sexual differences.

Forslund et al., (2016) examined some of the relevant performance variables related to ADHD symptoms and behavioural problems to explain the transposition of symptoms. The hypothesis was that some ADHD symptoms unrelated to the disorder itself mask and prevent detection of other deficits and comorbidities (Eyrea et al., 2017). In this sense, it was found that disorganized attachment behaviours and negative emotionality considered as part of ADHD behaviour problems, actually depended on other comorbid disorders associated to it but not on the disorder *per se*. In view of this, to develop optimal interventions focused on each of the external comorbid disorders associated to ADHD, the authors warn about the need to use a more open approach not focused exclusively on

the existing diagnostic criteria, but one dissociated from behavioural problems. That is, they are in favour of emphasising *theoretical models including multiple pathways to ADHD* with cognitive inhibition, emotion regulation and positive emotionality as specific parts of ADHD symptoms but independent of the disorder itself (Forslund et al., 2016; Vázquez-Justo et al., 2017a). The complexity of the disorder requires having assessment instruments, a large battery of items to measure, 1) its three dimensions, hyperactivity, inattention and impulsiveness in the different evolutionary stages of the child, and 2) other behavioural manifestations related to the comorbid problems derived from the functional deterioration that this disorder causes in the life of the individual. That DSM 5 is an integral part of the diagnosis but not the only evaluation instrument (García et al., 2014).

Initial interview

The diagnosis of ADHD is clinical and is based on an interview considered to be one of the main tools of the evaluation process. Regarding diagnosis, three symptoms are considered basic in ADHD (attention deficit, hyperactivity and impulsivity) along with other characteristics, as explained (Piñón et al., 2017a). Since there is no biological marker for the diagnosis of ADHD that makes it possible to rule out other causes of the child's behaviour and poor school performance, and that the causes of the disorders can be multiple, even social, IACS suggests seeking a solution not limited to a single therapeutic option, but one that could be different in each case. It tackles ADHD as a joint effort of mothers, fathers, the child in question, and teachers (Urchaga, 2017). And it proposes to carry out a deep anamnesis of the child that contains: a) Identification of comorbidities and a differential diagnosis; b) Psychopedagogical evaluation of the child and his family; c) Educational assessment through the child's teachers. That is to say, that the people who interact in the close environment of the child's life, such as the parents, teachers and other people, complete self-evaluation scales (parents) and children behaviour questionnaires, as these will provide information regarding the severity of the symptoms and the presence of other possible disorders without replacing an adequate clinical evaluation; and d) Medical evaluation. Taking into account the evidence of the genetic aspect of ADHD, the medical evaluation should include the child's detailed medical history and that of his/her parents (IACS, 2017).

Considering the above and the biopsychosocial approach, the diagnosis of ADHD should be tackled from a multifactorial perspective that takes into account the following variables, 1. A complete anamnesis of the affected person, their parents and close relatives wherever possible. 2. A differential diagnosis with behavioural, learning, affective or anxiety disorders, among others. Including everything that allows us to clearly rule out that the symptoms and the school behaviour or performance problems are not the consequence of one or more of the numerous disorders typical of childhood with symptoms similar to that of ADHD, such as behavioural, learning, anxiety, affective disorders among which we could find generalized anxiety, depression, obsessive-compulsive disorder, etc. Or other pathologies like recreational or other drug abuse, or other psychological problems (Franke et al., 2018; IACS, 2017). 3. Considering an in-depth assessment of behaviour from the family perspective and the professionals involved in the child's education (Engel, 2012; García et al., 2014; IACS, 2017; Sloan et al., 2019). Four. The criteria established in the two most recognized international classifications that include this disorder (DSM 5 and CIE-11- EMM), must be met (IACS, 2017).

ADHD Diagnosis

In order to diagnose ADHD, the existence of a chronic and generalized history of hyperactivity, distraction and impulsiveness is essential (DSM-5, 2014; Silver, 2004). The criteria established in DSM-5 and CIE-11- EMM must be met. For those children who present the three characteristic symptoms of the disorder with a clear functional repercussion in their personal, family, academic and/or social environment and, after ruling out other disorders or problems that may account for the observed symptoms, a positive diagnosis of ADHD should be made (NICE en Piñón et al., 2017a). Once the diagnosis and treatment have been made and, given the high comorbidity of ADHD, IACS recommends a cross-sectional evaluation that allows: 1. Identifying the efficacy of the treatment in terms of reducing the learning problems, attitudes, behaviour and comorbidity associated with ADHD. 2.

ANALYSIS OF THE MAIN ADHD DIAGNOSIS VARIABLES FOR CHILDREN BETWEEN 6-12 YEARS OF AGE

If the treatment is driving changes that improve the daily functioning of the child in his family, as well as social relationships, and the modification of his behaviour (IACS, 2017).

PROPOSAL FOR THE MAIN VARIABLES OF ADHD DIAGNOSIS FOR CHILDREN 6-12 YEARS OLD

Being hyperactive, inattentive and impulsive is very common in children 6-12 years old, but they are also behaviours indicative of a ADHD. Therefore, taking into account the weight of the genetic causes of this disorder and its high comorbidity, and in view of the adverse effects of pharmacology, will also be required. It is necessary to know the child in all his context to be able to diagnose whether or not he has ADHD. For this, the professional must have: 1. A complete history of the child that addresses the family's typical environment and social environment and includes a complete medical history of the child and its parents; 2. Appropriate measurement instruments such as symptomatic and behavioural evaluation scales, cognitive and neuropsychological examinations and tests, computerised evaluation tests of sustained attention and impulsiveness, and neuroimaging tests if necessary; 3. A comprehensive differential diagnosis that takes into account all possible causes of the child's abnormal behaviours and identifies comorbidities; 4. The diagnostic criteria of DSM-5 and CIE-11- EMM.

BIBLIOGRAPHIC REFERENCES

- Agha, S. S., Zammit, S., Thapar, A., & Langley, K. (2013). Are parental ADHD problems associated with a more severe clinical presentation and greater family adversity in children with ADHD? *Eur Child Adolesc Psychiatry*, 22, 369–377. doi:10.1007/s00787-013-0378-x
- Arnett, A. B., McDonald, B., & Pennington, B. F. (2013). Cognitive and behavioral indicators of ADHD symptoms prior to school age. *Journal of Child Psychology and Psychiatry*, 54(12), 1284–1294. doi:10.1111/jcpp.12104
- Carlson, N. R. (2014). *Fisiología de la conducta* (11th ed.). Madrid: Pearson.
- Delgado, M. L. (2014). *Fundamentos de psicología*. Madrid, España: Médica Panamericana.
- DSM 5. American Psychiatric Association. (2014). *Manual diagnóstico y estadístico de los trastornos mentales* (5th ed.). Madrid: Médica Panamericana.
- Engel, G. L. (2012). The need for a new medical model: A challenge for biomedicine. *Psychodynamic Psychiatry*, 40(3), 377–396. doi:10.1521/pdps.2012.40.3.377
- Eyrea, O., Langley, K., Stringaris, A., Leibenluft, E., Collishawa, S., & Thapar, A. (2017). Irritability in ADHD: Associations with depression liability. *Journal of Affective Disorders*, 215, 281–287. doi:10.1016/j.jad.2017.03.050
- Fernandes, S. M., Piñón, A., & Vázquez-Justo, E. (2017). Concepto, Evolución y Etiología del TDAH. Concept, Evolution and Etiology of ADHD. In Vázquez-Justo, E., & Piñón, A. (Ed.), *THDA y Trastornos Asociados [ADHD and Associated Disorders]* (pp. 1-7). Maribor-Slovenia: Institute for Local Self-Government Maribor. doi:10.4335/978-961-6842-80-8
- Flood, E., Gajria, K., Sikirica, V., Dietrich, C. N., Romero, B., (...) Chen, K. (2016). The caregiver perspective on paediatric ADHD (CAPP) survey: Understanding sociodemographic and clinical characteristics, treatment use and impact of ADHD in Europe. *Journal of Affective Disorders*, 200, 222–234. doi:10.1016/j.jad.2016.04.011
- Forslund, T., Brocki, K. C., Bohlin, G., Granqvist, P., & Eninger, L. (2016). The heterogeneity of attention-deficit/hyperactivity disorder symptoms and conduct problems: Cognitive inhibition, emotion regulation, emotionality, and disorganized attachment. *British Journal of Developmental Psychology*, 34, 371–387. doi:10.1111/bjdp.12136
- Franke, B., Michelini, G., Asherson, P., Banaschewski, T., Billow, A., (...) Reif, A. (2018). Live fast, die young? A review on the developmental trajectories of ADHD across the lifespan. *European Neuropsychopharmacology*, 28, 1059–1088. doi:10.1016/j.euroneuro.2018.08.001

- García, J. V., Grau, C., & Garcés, J. (2014). Cuestionarios TDAH para profesores. un análisis desde los criterios del DSM-IV-TR y DSM-V. [ADHD questionnaire for teachers. An analysis from the DSM-IV-TR and DSM-V criteria] *Revista Española De Orientacion Y Psicopedagogia (REOP)*, 25(1), 62-77. doi:10.5944/reop.vol25.1.2014.12013
- IACS. Instituto Aragonés de Ciencias de la Salud. (2017). In Ministerio de Sanidad Servicios Sociales e Igualdad e Instituto Aragonés de Ciencias de la Salud (Ed.), *Guía de práctica clínica sobre las intervenciones terapéuticas en el trastorno por déficit de atención con hiperactividad (TDAH)* Retrieved from https://portal.guiasalud.es/wp-content/uploads/2018/12/GPC_574_TDAH_IACS_compl.pdf
- Kaiser, R. M. (2017). Should home visits be mandatory for medical students? VA Perspectives. *Frontiers. American Academy of Home Care Medicine (AAHCM)*, 31(1), 3. Retrieved from https://cdn.ymaws.com/www.aahcm.org/resource/resmgr/frontiers/AAHCM17_January.pdf
- Lazaratou, H., & Golse, B. (2018). L'hyperactivité, entre biologie et culture. les variations géographiques, temporelles et culturelles du trouble déficitaire de l'attention avec hyperactivité. *La Psychiatrie de L'Enfant*, 61, 179-198. doi:10.3917/psyse.611.0179
- Lecei, A., Van Hulst, V. M., de Zeeuw, P., & Van der Pluijm, M., Rijks, Y., & Durston, S. (2019). Can we use neuroimaging data to differentiate between subgroups of children with ADHD symptoms: A proof of concept study using latent class analysis of brain activity. *NeuroImage: Clinical*, 21 doi:10.1016/j.nicl.2018.11.011
- López, C., Romero, A., Castro, M., Alcántara, M., Belchi, A. I., (...) & Guillermo, M. (2013). In Grupo Anaya S. A. (Ed.), *TDAH y trastornos del comportamiento en la infancia y la adolescencia. Clínica, diagnóstico, evaluación y tratamiento*. Madrid: Pirámide.
- Mautone, J. A., Marshall, S. A., Sharman, J., Eiraldi, R. B., Jawad, A. F., & Power, T. J. (2012). Development of a family-school intervention for young children with attention deficit hyperactivity disorder. *School Psychology Review*, 41(4), 447-466.
- Molina, M. F. & Musich, F. M. (2016). Perception of parenting style by children with ADHD and its relation with inattention, hyperactivity/impulsivity and externalizing symptoms. *J Child Fam Stud* (2016) 25:1656-1671, 25, 1656-1671. doi:10.1007/s10826-015-0316-2
- OMS. Organización Mundial de la Salud. (2018). CIE-11. EMM. clasificación internacional de las enfermedades 11. versión del 2018. Retrieved from <https://icd.who.int/browse11/l-m/es>
- Peasgood, T., Bhardwaj, A., Biggs, K., Brazier, J. E., Coghill, D, (...) Sonuga-Barke, J. S. (2016). The impact of ADHD on the health and well-being of ADHD children and their sibling. *Eur Child Adolesc Psychiatry*, 25, 1217-1231. doi:10.1007/s00787-016-0841-6
- Piñón, A., Vázquez-Justo, E., & Fernandes, S. M. (2017a). Diagnóstico y Comorbilidad del TDAH. In Vázquez-Justo, E., & Piñón, A (Ed.), *THDA y Trastornos Asociados* [ADHD and Associated Disorders] (pp. 7-21). Maribor-Slovenia: Institute for Local Self-Government Maribor. doi:10.4335/978-961-6842-80-8
- Piñón, A., Vázquez-Justo, E., & Fernandes, S. M. (2017b). Modelos Neuropsicológicos. Neuropsychological Models of ADHD. In Vázquez-Justo, E., & Piñón, A (Ed.), *THDA y Trastornos Asociados* [ADHD and Associated Disorders] (pp. 21-36). Maribor-Slovenia: Institute for Local Self-Government Maribor. doi:10.4335/978-961-6842-80-8
- Reilly, C., Senior, J., & Murtagh, L. (2015). ASD, ADHD, mental health conditions and psychopharmacology in neurogenetic syndromes: Parent survey. *Journal of Intellectual Disability Research*, 59(4), 307-318. doi:10.1111/jir.12147
- Sancho, H. (2017). Tratamiento Farmacológico Del Trastorno Por Déficit de Atención e Hiperactividad (TDAH). Pharmacological Treatment of Attention Deficit Hyperactivity Disorder (ADHD) . In Vázquez-Justo, E., & Piñón, A (Ed.), *THDA y Trastornos Asociados* [ADHD and Associated Disorders] (pp. 83-101). Maribor-Slovenia: Institute for Local Self-Government Maribor. doi:10.4335/978-961-6842-80-8

ANALYSIS OF THE MAIN ADHD DIAGNOSIS VARIABLES FOR CHILDREN BETWEEN 6-12 YEARS OF AGE

- Silver, L. B. (2004). In Psiquiatría Editores S.L. (Ed.), *Attention-Deficit/Hyperactivity Disorder. A Clinical Guide to Diagnosis and Treatment for Health and Mental Health Professionals* [Trastorno por déficit de atención con hiperactividad. Guía clínica de diagnóstico y tratamiento para profesionales de la salud.] (1ª ed.). Barcelona: Ars Medica.
- Sjo"wall, D., Roth, L., Lindqvist, S., & Thorell, L. B. (2013). Multiple deficits in ADHD: Executive dysfunction, delay aversion, reaction time variability, and emotional deficits. *Journal of Child Psychology and Psychiatry*, 54(6), 619–62. doi:10.1111/jcpp.12006
- Sloan, S., Winter, K., Connolly, P., & Gildea, A. (2019). The effectiveness of nurture groups in improving outcomes for young children with social, emotional and behavioural difficulties in primary schools: An evaluation of nurture group provision in Northern Ireland. *A Children and Youth Services Review*, doi:10.1016/j.childyouth.2019.104619
- Sollie, H., Mørch, W-T., & Larsson, B. (2016). Parent and family characteristics and their associates in a follow-up of outpatient children with ADHD. *J Child Fam Stud*, 25, 2571–2584. doi:10.1007/s10826-016-0411-z
- Trillingsgaard, T., Trillingsgaard, A., & Webster-Stratton, C. (2014). Assessing the effectiveness of the 'Incredible years parent training' to parents of young children with ADHD symptoms – a preliminary report. *Scandinavian Journal of Psychology*, 55, 538–545. doi:10.1111/sjop.12155
- Urchaga, J. D. (2017). La obra del dr. dionisio manga: Análisis bibliométrico, impacto y temática. *Psychology, Society, & Education*, 9(3), 369-380. doi:10.25115/psye.v9i3.859
- Valverde, M. A., & Inchauspe, J. A. (2014). Alcance y limitaciones del tratamiento farmacológico del trastorno por déficit de atención e hiperactividad en niños y adolescentes y guías de práctica clínica. una revisión bibliográfica. *Revista Asociación Española De Neuropsiquiatría*, 34(121), 37-74. doi:10.4321/S0211-57352014000100004
- Van den Hoofdakker, B. J., Hoekstra, P. J., Van der Veen-Mulders, L., Sytema, S., Emmelkamp, P. M. G., Minderaa, R. B., & Nauta, M. H. (2014). Paternal influences on treatment outcome of behavioral parent training in children with attention-deficit/hyperactivity disorder. *Eur Child Adolesc Psychiatry*, 23, 1071–1079. doi:10.1007/s00787-014-0557-4
- Van der Meer, D., Hartman, C. A., Richards, R., Bralten, J. B., Franke, B., (...) Hoekstra, P. J. (2014). The serotonin transporter gene polymorphism 5-HTTLPR moderates the effects of stress on attention-deficit/hyperactivity disorder. *Journal of Child Psychology and Psychiatry*, 55(12), 1363–1371. doi:10.1111/jcpp.12240
- Vázquez-Justo, E., Piñón, A., & Fernandes, S. M. (2017a). Alteraciones Neuropsicológicas y Neurofisiológicas en el TDAH. Neuropsychological and Neurophysiological Disorders in ADHD. In Vázquez-Justo, E., & Piñón, A (Ed.), *THDA y Trastornos Asociados* [ADHD and Associated Disorders] (pp. 36-55). Maribor-Slovenia: Institute for Local Self-Government Maribor. doi:10.4335/978-961-6842-80-8
- Vázquez-Justo, E., Piñón, A., & Fernandes, S. M. (2017b). Evaluación Neuropsicológica del TDAH. Neuropsychological Assessment in ADHD. In Vázquez-Justo, E., & Piñón, A (Ed.), *THDA y Trastornos Asociados* [ADHD and Associated Disorders] (pp. 55-83). Maribor-Slovenia: Institute for Local Self-Government Maribor. doi:10.4335/978-961-6842-80-8
- Von Rhein, D., Mennes, M., Van Ewijk, H., Groenman, A. P., Zwiers, M. P., (...) Buitelaar, J. (2015). The NeuroIMAGE study: A prospective phenotypic, cognitive, genetic and MRI study in children with attention-deficit/ hyperactivity disorder. Design and descriptives. *Eur Child Adolesc Psychiatry*, 24, 265–281. doi:10.1007/s00787-014-0573-4
- Waddington, F., Hartman, C., de Bruijn, Y., Lappenschaar, M., Oerlemans, A., (...) Rommelse, N. (2018). Visual and auditory emotion recognition problems as familial cross-disorder phenomenon in ASD and ADHD. *European Neuropsychopharmacology*, 28, 994–1005. doi:10.1016/j.euroneuro.2018.06.009
- Whitea, S., Gibsonb, G., & Wastellc, D. (2019). Child protection and disorganized attachment: A critical commentary. *Children and Youth Services Review*, 105, 104415. doi:10.1016/j.childyouth.2019.104415