

The Contribution of Neuropsychological Assessment to the Diagnosis of Autism Spectrum Disorder

A Contribuição da Avaliação Neuropsicológica no Diagnóstico do Transtorno do Espectro Autista

La Contribución de la Evaluación Neuropsicológica en el Diagnóstico del Trastorno del Espectro Autista

RESUMO

Este artigo aborda questões sobre a contribuição da Avaliação Neuropsicológica no diagnóstico do Transtorno do Espectro Autista (TEA). O objetivo deste é compreender de forma breve, contudo sistemática, de que maneira o profissional da psicologia pode contribuir na Avaliação Neuropsicológica em crianças autistas, bem como verificar como é feita a intervenção, e a relevância no diagnóstico precoce para melhor evolução na intervenção. Por intermédio de uma revisão bibliográfica qualitativa, procura uma compreensão sobre as características do autismo. Concluiu-se que a estimulação, o planejamento, e a atuação de profissionais capacitados no processo do diagnóstico, e de intervenção auxiliam em uma maior autonomia e desenvolvimento adequado para as crianças com autismo.

DESCRIPTORIOS: Autismo. Transtorno. Diagnóstico.

ABSTRACT

This article addresses issues regarding the contribution of Neuropsychological Assessment in the diagnosis of Autism Spectrum Disorder (ASD). The objective is to briefly, yet systematically, understand how psychology professionals can contribute to Neuropsychological Assessment in autistic children, as well as to verify how the intervention is carried out and its relevance in early diagnosis for better intervention outcomes. Through a qualitative literature review, it seeks to understand the characteristics of autism. It was concluded that stimulation, planning, and the work of trained professionals in the diagnosis and intervention process contribute to greater autonomy and appropriate development for children with autism.

DESCRIPTORS: Autism. Disorder. Diagnosis.

RESUMEN

Este artículo aborda cuestiones sobre la contribución de la Evaluación Neuropsicológica en el diagnóstico del Trastorno del Espectro Autista (TEA). El objetivo es comprender, de forma breve pero sistemática, cómo el profesional de la psicología puede contribuir en la Evaluación Neuropsicológica de niños autistas, así como verificar cómo se realiza la intervención y la relevancia del diagnóstico precoz para una mejor evolución en la intervención. A través de una revisión bibliográfica cualitativa, se busca una comprensión sobre las características del autismo. Se concluyó que la estimulación, la planificación y la actuación de profesionales capacitados en el proceso de diagnóstico e intervención contribuyen a una mayor autonomía y un desarrollo adecuado en los niños con autismo.

DESCRIPTORIOS: Autismo. Trastorno. Diagnóstico.

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INTRODUCTION

The proposed theme leads us to reflect on and understand the importance of cognitive stimulation beginning in early childhood, based on the concept of brain plasticity. During this period, with the diagnosis of ASD and interventions beginning at this stage, it is possible to achieve better results and progress for the autistic person in the future.

According to Mayra Gaiato¹, ASD is a neurodevelopmental disorder in which some neurological functions do not develop as expected in the respective brain areas of individuals affected by it. As a result, individuals with autism have difficulties socializing and may experience delays in language development, self-care, learning, and other areas. Scientifically proven studies show that the earlier a child is stimulated and receives the right stimuli, the greater their quality of life and autonomy will be.

Neuroscience studies the nervous system and has presented studies related to the quality of life of children through early diagnosis and intervention. Based on the development of research, the number of people diagnosed with ASD (Autism Spectrum Disorder) has also been growing, in which the demand and search for greater autonomy and understanding of the etiology, its characteristics, and forms of learning have caught the attention of neuroscientists, who have highlighted the importance of this diagnosis in early childhood through scientific evidence.

According to Pinheiro², neuropsychology or cognitive neuroscience is defined as the science that investigates the relationship between the nervous system, behavior, and cognition.

Neuropsychology works with a multidisciplinary team in the assessment

and prognosis of ASD, assisting through behavior analysis and the application of measurable, scientifically based tests in the medical diagnosis of the disorder or ruling out its possibility. However, the neuropsychologist can create protocols to initiate interventions with the child, verifying the best adaptation of the teaching method.

Thus, through bibliographic research, with sources from scientific reference websites, books, and scientific journals, seeking greater understanding and flexibility regarding early diagnosis in children with ASD, the transmission of knowledge addressed in these publications is proposed in a harmonious way, providing a reflection to present greater possibilities for development.

DEVELOPMENT

For Nascimento³, autism is considered a neurodevelopmental disorder, a behavioral disorder with early onset and chronic course that encompasses multiple areas of development. Therefore, the earlier it is diagnosed, the greater the likelihood of adequate development. According to Dawson⁴, this not only reduces the risk of more severe symptoms throughout development, but also improves the prognosis.

According to Nascimento³, the etiology of autism is heterogeneous and multifactorial, although research points to a complex genetic, biological, perinatal, and psychosocial influence. In most cases, children with ASD have little or no social interaction with their parents, do not differentiate between important people, lack social smiling, lack eye contact, and have impaired anticipatory posture. They may experience extreme anxiety when faced with changes in their daily routine. During the school years, they tend to isolate themselves, with impaired ability to

play and defend themselves.

They may also show interest only in repetitive activities, manipulation of objects with little symbolic meaning, creation of rituals, stereotypical movements, as well as demonstrating language deficits, echolalia, episodes of aggression, sleep disorders, among others, according to the criteria presented in the DSM V.

The diagnosis of ASD is made clinically, and it is important to have an interdisciplinary team so that the development and diagnostic process is carried out safely, correctly, and with quality of life, eliminating the risk of erroneous reports. According to Nascimento³, neuropsychological assessment makes an important contribution to the correct diagnosis of autism. However, there are no biological markers for this disorder.

Still according to the author, the assessment relies on accurate diagnostic tools, no longer based solely on observation, using scientifically based and referenced neuropsychological tests to confirm the diagnosis.

Thus, the role of the neuropsychologist becomes very important in the process, as this professional is qualified to perform tests that will provide a view beyond what the doctor sees in the office, through a descriptive report of the batteries of tests performed, preserved cognitive abilities, unpreserved cognitive abilities, and/or impaired cognitive abilities.

According to Dawson⁴, the brain network responsible for social development has structures involved in processing social information, emotion, and social behavior. Children are able to process visual and auditory stimuli from the outside environment before developing the motor skills that will allow them to explore their physical environment.

This sensitivity enables them to focus

on new things rather than avoid them, but it depends on the stimulation received, without which the baby becomes hypo- or hyperstimulated. So, when children engage in social interactions, they constantly monitor what others do and adjust their own behavior according to the responses of others. Chawarska et al.⁵ add that from an early age, children process social information based on the perception of facial expressions, especially in the eyes.

One of the main functions of the prefrontal cortex is the ability to modify one's own behavior in response to feedback, according to Uehara, Mata, Fichman, & Malloy-Diniz, known as executive functions. This is considered the basis for flexibility in behavior directed toward a proposed intention, the opposite of which is rigidity in behavior and perseverance in the same activity of sensory interest.

Executive functions encompass a set of complex behavioral processes that allow individuals to independently and autonomously perform activities that involve planning, organization, and execution based on motivation and awareness of themselves and their environment.¹

Neuropsychology has been working with the main objective of analyzing executive functions, encompassing the ability to develop and plan strategies for achieving goals. It also proposes the assessment of brain injuries and dysfunctions, assisting in the formulation of the diagnosis. Thus, difficulties in cognitive and neuropsychological processes are related to executive functions in the processes of coping with challenges related to the social and communicative area of people with ASD. Studies in the area show a pattern of inflexibility and perseverance in the behavior of these patients, according to Christ et al.⁷

The author also reports that it can be understood, then, that restricted interests and repetitive behaviors, such as following the same routine, choosing the same toy or part of it, are related to the impairment of executive functions and socio-communicative skills, the ability to deal with stimuli, and behavioral flexibility, which

can be assessed through the observation of behaviors by a trained professional, which often involves playful processes and tests designed to assess attention, concentration, memory, learning, motor skills, mathematics, language, among others.

According to Gaiato¹, people with autism have impairments in executive functions and skills, which can lead to deficits in learning through feedback and a lack of inhibition of irrelevant and inefficient responses.

According to the author, the results of neuropsychological assessment can be used to develop intervention strategies and protocols aimed at stimulating impaired and preserved cognitive, behavioral, and emotional aspects associated with brain dysfunction, intervening with neuropsychological rehabilitation to improve the individual's functionality and autonomy.

According to Nascimento³, the assessment provides knowledge of which areas of the brain are responsible for each cognitive skill, thus it is possible to work on the control and regulation of thoughts, emotions, and behaviors, basing clinical and educational strategies that aim to provide individuals with autism with learning processes and strategies for better development of autonomy, emotional, behavioral, social, and communication skills, proposing a balance for the individual.

Studies focused on brain plasticity show that in the first years of life, considered early childhood, there is greater openness and absorption of new knowledge, and over time, changes occur in the structure and processing of information.

According to Pinheiro⁸, the developing brain is plastic, that is, capable of reorganizing patterns and systems of synaptic connections with a view to readjusting the growth of the organism to the child's new intellectual and behavioral capacities.

According to Piaget and Inhelder⁹, mental development during the first eighteen months of life is rapid and important because the child develops at this level the set of cognitive substructures that will make subsequent perceptual and intel-

lectual constructions, as well as a certain number of elementary affective reactions, which will determine, in part, their subsequent affectivity.

The author also reports that brain plasticity is a remodeling of the brain, which has a dynamic form in child development, allowing the construction, acquisition, and interaction of new skills. Therefore, any stimulus, whether good or bad, in the environment or in the individual will have an impact on the acquisition of their motor and cognitive skills. And even considering genetic factors, the subject's experiences will also favor or not favor the absorption of learning, leading to the interpretation that the amount or lack of stimuli will have an impact on the brain structure.

However, it is understood why early childhood is the most appropriate period for acquiring the skills considered important that will accompany us throughout life, because our neurons are developing and have a better adaptive capacity than mature cells, as Piaget demonstrates in this excerpt:

The importance of this period has often been overlooked, because it is not accompanied by words that allow us to follow the progress of intelligence and feelings step by step, as we do later on. But in fact, it is decisive for the entire course of psychic evolution: it represents the conquest, through perception and movement, of the entire practical universe that surrounds the child.¹⁰

The relationship between learning and neuroplasticity occurs in its form of development where plasticity occurs through learning and, in the same way, learning generates stimuli for plasticity to occur. Thus, the functions attributed to mirror neurons, which are fundamental for situations of danger, imitation, and empathy, are altered in individuals diagnosed with ASD.

For Silva¹¹, once the diagnosis of autism has been confirmed or not confirmed, it is important to refer the child to other professionals and appropriate interventions, so professionals need to

determine whether any referral is still necessary. This may include referrals to occupational therapists, neurologists, physical therapists, speech therapists, geneticists, and/or professionals who deal with eating and/or sleeping problems.

It is of utmost importance that the child and their family are referred to specific educational programs, as well as intensive behavioral intervention programs and parent training programs aimed at eliminating the individual's behavioral problems.

The same author reports that after neuropsychological assessment, it can be ensured that all the different areas in which the child has problems will be effectively investigated and treated. Annual evaluations are also highly recommended so that the child's progress can be monitored over the years, assisting in the review of the programs and interventions received.

FINAL CONSIDERATIONS

Through this work, it is possible to perceive the contribution of neuropsychological evaluation in the diagnosis of autism spectrum disorder (ASD). Neuropsychologists are professionals qualified to perform psychological tests that can measure preserved and unpreserved cognitive abilities, as well as impairments and delays in neurological development, assisting physicians through descriptive reports of test batteries.

The scientists cited above highlight the importance of neuropsychological assessment in the diagnosis of autism spectrum disorder and in early intervention in children with ASD, given that in early childhood there is greater neuronal plasticity, enabling gains in cognitive stimuli throughout the interventions performed, allowing the autistic subject greater auton-

omy, quality of life, and learning.

Therefore, it can be concluded that neuropsychological assessment in autism spectrum disorder is of great relevance, that is, it will enable an accurate diagnosis and, through interventions, significant changes will occur with cognitive training, favoring the development of autonomy and learning with greater effectiveness. Through neuropsychological assessment, professionals can create protocols for cognitive and behavioral stimulation appropriate to the skills to be preserved, stimulated, and acquired. I consider it important to conduct new research and studies on the importance of neuropsychological assessment in the context of the diagnosis of Autism Spectrum Disorder for a better understanding and future advances in prognosis.

REFERENCES

- Gaiato M. S.O.S. autismo: guia completo para entender o transtorno do espectro autista. 1a ed. São Paulo: Nversos; 2018.
- Pinheiro M. As bases biológicas da neuropsicologia: uma contribuição à formação de educadores. *Temas sobre Desenvolvimento*. 2005-2006;14(83-84):4-13.
- Nascimento FF do, Cruz MLRM da. Da realidade à inclusão: uma investigação acerca da aprendizagem e do desenvolvimento do/a aluno/a com transtornos do espectro autista-TEA nas séries iniciais do I segmento do ensino fundamental. *Rev Polyphonia*. 2014;25(2):51-66.
- Dawson G. Intervenção comportamental precoce, plasticidade cerebral e prevenção do transtorno do espectro do autismo. *Desenv Psicopatol*. 2008;20(3):775-803. doi:10.1017/s0954579408000370.
- Chawarska K, Macari S, Shic F. Diminuição da atenção espontânea às cenas sociais em bebês de 6 meses de idade mais tarde diagnosticados com transtornos do espectro do autismo. *Biol Psychiatry*. 2013;74(3):195-203. doi:10.1016/j.biopsych.2012.11.022.
- Uehara E, Mata F, Fichman HC, Malloy-Diniz LF. Funções executivas na infância. In: Salles JF, Haase VG, Malloy-Diniz LF, editores. *Neuropsicologia do desenvolvimento: infância e adolescência*. Porto Alegre: ArtMed; 2016. p.17-27.
- Christ SE, Kester LE, Bodner KE, Miles JH. Evidência de comprometimento inibitório seletivo em indivíduos com transtorno do espectro do autismo. *Neuropsychology*. 2011;25(6):690-701. doi:10.1037/a0024256.
- Pinheiro M. Fundamentos de neuropsicologia: o desenvolvimento cerebral da criança. *Vita et Sanitas*. 2015;1:34-48.
- Piaget J, Inhelder B. *A psicologia da criança*. 3a ed. Rio de Janeiro: Difel; 2007.
- Piaget J. *Seis estudos de psicologia*. 24a ed. Rio de Janeiro: Forense Universitária; 2004.
- Relvas MP. *Neurociência e transtornos de aprendizagem: as múltiplas eficiências para uma educação inclusiva*. 5a ed. Rio de Janeiro: Wak Ed; 2011.
- Silva M, Mulick JA. Diagnosticando o transtorno autista: aspectos fundamentais e considerações práticas. *Psicol Ciênc Prof*. 2009;29(1):116-31. doi:10.1590/S1414-98932009000100010.