Open access Journal of
Neurology & Neurosurgery
ISSN: 2476-0501

Juniper Publishers
key to the Researchers

Mini review
Volume 13 Issue 2 - March 2020
DOI: 10.19080/OAJNN.2020.13.555857

Open Access J Neurol Neurosurg

Neuropsychological Assessment Contributions in Autism Diagnosis

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Submission: February 29, 2020; **Published:** March 11, 2020

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Abstract

The Autism Spectrum Disorder is characterized by deficits on social interaction and communication and by the presence of restrict repertoire of behaviors, activities and interests. The comprehension about this neurodevelopment disorder remains complex nowadays, owing to its unknown etiology. Neuropsychological Assessment provides a deep analysis of cognitive functioning in people with such diagnosis, by being an auxiliary tool in the process of investigation, confirming or not the ASD diagnosis with higher precision. This branch of neuropsychological science contributes a lot to assertive interventions and therapeutic indications, by studying the interaction of brain functioning and human behavior. This study will contribute by presenting Brazilian publications that demonstrate the neuropsychological assessment for the differential diagnosis of ASD. It will be discussed and summarized some of this tool contributions at the national level, indicating the most used tests in Brazilian scenario. It is emphasized that neuropsychological evaluation contributes significatively due to identification of impairments on cognitive functions that are very important for human development.

Keywords: Neuropsychological assessment; Differential diagnosis; Autism spectrum disorder

Abbreviations: ASD: Autism Spectrum Disorder; BDTD: Brazilian Digital Library of Theses and Dissertations; CARS: Childhood Autism Rating Scale; DSM: Diagnostic and Statistical Manual of Mental Disorders; RCPM: Raven's Colored Progressive Matrices; WHO: World Health Organization; WISC: Wechsler Intelligence Scale for Children

Introduction

According to the World Health Organization (WHO) report, a global average of 1 in 160 people is diagnosed with Autistic Spectrum Disorder (ASD) [1]. The understanding about ASD remains complex today, justified by the absence of etiology or defined causes [2]. It is known, however, that this neurodevelopment disorder encompasses and involves conditions related to a group of quantitative and qualitative commitment of developmental specific skills, among which are communicative, behavioral and social skills [3]. Autism Spectrum Disorder is a term now used by the fifth edition of the Diagnostic Statistical Manual of Mental Disorders (DSM-V), which presents a single condition with different subdivisions regarding the level of severity related to interaction, social aspects of communication (verbal or non-verbal) and in the patterns of restricted and repetitive behaviors [4]. In the spectrum, the level of severity varies according to the support demand demanded by the individual. Behaviorally, losses in social communication can be evidenced by deficits in socioemotional reciprocity, qualitative losses in social interaction, difficulties in adapting to other contexts, making friends, starting a dialogue or maintaining a conversation sharing interests; difficulty in spontaneous nonverbal communicative behaviors, in understanding other people's interests and feelings, as well as in responding to other people's emotions and atypical attachment [5,6].

Regarding to restricted and repetitive behavior patterns, the child may present echolalia, motor stereotypes, mannerisms, absence of spontaneous imitative, symbolic or exploratory play, repetition of routines with resistance to changes, very limited interests, hyper or hyposensitivity to sensory stimuli, as, for example, they may be insensitive to pain and hypersensitive to sound [7,8]. Affected children often express an idiosyncratic interest in a range of restricted activities, resistance to change,

unusual gestures, avoidance of social interaction and do not react to the actions of their peers [3]. Due to this multiplicity and variety of characteristics, a more accurate psychological assessment is extremely necessary to determine the ASD diagnosis and its level of severity, as well as to elaborate and to plan efficient interventions effectively. In this sense, the neuropsychological evaluation is configured as an auxiliary tool in the investigation, being a valuable instrument to confirm the diagnosis of ASD with greater precision [9], contributing to more assertive therapeutic indications. Coming from neuropsychological science, it is a branch dedicated to the study of the interaction of brain functioning and human behavior, based on the functional analysis of cognitive processes and multidimensional understanding of possible losses [10]. The present contribution will illustrate Brazilian publications that demonstrate the neuropsychological assessment for the differential diagnosis of ASD, by summarizing some of their contributions at the national level. Based on a systematic literature review, this study presents a national panorama of publications that shows the contributions of Neuropsychological Assessment for the diagnosis of ASD. The methodological procedure adopted consisted on a survey of bibliographic references. As it integrates complete scientific publications from 107 graduate programs and provides greater visibility of national productions [11], the Brazilian Digital Library of Theses and Dissertations (BDTD) was determined as a search source. The survey of the studies was carried out in February 2020, in Portuguese and English, in view of the availability of some theses and dissertations in the English language.

It was considered the descriptors Neuropsychological Assessment, Diagnosis, Autistic Spectrum Disorder, and the time frame 2013 - 2019, in view of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. Productions available in their entirety, published in the field of Psychology and that presented in the abstract the Neuropsychological Assessment in ASD diagnosis were selected, analyzed in full, providing data that were tabulated and organized into the categories: year of publication; author; and characterization of Neuropsychological Assessment in ASD diagnosis. After some researches and estimations, we found out the most used tests from neuropsychological science to autism diagnosis. It is seen a deep relationship between executive functions and neurodevelopment of the person with ASD. Among the most used tests in Brazil between the years 2013 - 2019, it can be seen: Wechsler Intelligence Scale for Children IV (WISC), Childhood Autism Rating Scale (CARS) and Raven's Colored Progressive Matrices (RCPM).

The Wechsler Intelligence Scale for Children IV (WISC IV) is one of the most commonly used tests for measuring intelligence in ASD individuals, and there is a wealth of literature on this tool. It is a clinical instrument, of individual application, used to assess intellectual capacity, subdivided into verbal and execution subtests [12]. It is the most used instrument according to the Brazilian scientific literature. This fact suggests that it is a useful and essential evidence in the process of neuropsychological assessment. WISC-IV contributes by guiding the hypotheses about areas of cognitive dysfunction and for the choice of complementary tests, in order to achieve a differential diagnosis [13]. The cognitive functions that are assessed that contributes to the comprehension of ASD are: Intelligence, Operational Memory, Verbal Understanding, Processing Speed and Perceptual Reasoning [14]. Cognitive profiles in ASD, such as those documented, can serve as informative key for future investigations and also have clinical implications. The Childhood Autism Rating Scale (CARS) contains 15 items for complementary assessment of the diagnosis of autism and severity (mild, moderate and severe) [15]. It contributes to ASD diagnosis because it distinguishes children with ASD from typical children, making it possible to differentiate children with ASD from children with impaired development, however, without having ASD [16]. In addition to a general category of impression of autism, 14 domains that are usually affected in ASD are analyzed by CARS, and some of which are: interpersonal relationship, imitation, emotional response, body use, use of objects, use of the look, hearing, taste, smell, touch, response to changes, activity level, verbal and non-verbal communication, fear or nervousness, level and consistency of the intellectual response [17].

Also, research has shown that CARS has a high degree of consistency and test-retest reliability, as well as high validity values, making it easier to recognize and classify ASD by providing information about children's behavior and the severity of symptoms [15]. The use of this instrument is encouraged in Brazil in order to improve diagnostic accuracy and agreement with other diagnostic instruments. The Raven's Colored Progressive Matrices (RCPM) test is a non-verbal instrument that contributes to ASD differential diagnosis because it is used to assess intelligence, specifically the g factor (general intellectual capacity) and its two components: education and reproduction [18]. Education is the ability to extract meaning from an unclear situation and to develop new understandings of what is given. Reproduction includes the recall and reproduction of materials that are part of prior knowledge [19]. The RCPM is performed from the presentation to the subjects, individually, of geometric figures reproduced on paper, with a missing part. The task consists of indicating, pointing out, which part of the figure would complete the main drawing, with the suggested parts of figures being available as alternatives [20]. This very important test of general and fluid intelligence contributes a lot in order to more fairly assess the potential of autistic children. As we could notice through this study about the contributions of the Neuropsychological Assessment for ASD diagnosis, there is a deep relationship between executive functions and the neurodevelopment of people with ASD. The neuropsychological assessment precisely identifies with the mentioned psychological instrumentals, impairments from the analysis of important cognitive functions for human development.

Therefore, the contributions of neuropsychological assessment

How to cite this article: Amanda Lima Rubim, Ana Flávia Lima Teles da Hora, Alexia Lima Lobato. Neuropsychological Assessment Contributions in Autism Diagnosis. Open Access J Neurol Neurosurg. 2020; 13(2): 555857.DOI: 10.19080/OAJNN.2020.13.555857

to ASD are notorious in the national Brazilian scenario, where their relevance is highlighted for being an effective instrument for differential diagnosis, due to the lack of biological markers for this disorder. This is an important step forward, given its contribution to an earlier diagnosis, and consequently, early well-planned and efficient interventions.

Knowledge about the intellectual and cognitive functioning of each patient that has ASD diagnosis is essential for the design of appropriate and effective individual interventions. In this way, we can assure that paths are opened for a safe and precise intervention, with a view to the development of the atypical person in social environment.

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