

CASE REPORT

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Autistic spectrum disorder and fairy tales: A case study

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ABSTRACT

Introduction: Autism spectrum disorder is a neurodevelopmental disorder identified by atypical behavioral manifestations, which may present a restricted repertoire of interests and activities and poor communication and social interaction. Its etiology remains unknown and is present in more than 500,000 people throughout Brazil. In this article, there is a brief literature review for the basis of the autistic spectrum disorder and its finding in the patient regarding her wonder about the fairytale princess.

Case Report: JAD, 17 years old, is a student without comorbidities. She had been diagnosed with Autistic Spectrum Disorder, Cognitive Deficit, and Epilepsy. At 14 months, she started convulsive crises that were difficult to control, about four episodes daily. About ten months ago, an obsession with a specific fairy tale character (Snow White) began. She put herself in the character's place and suffered from "supposedly" not receiving visits from the entire group that made up the fairy tale. She

had severe cognitive delay and disjointed reasoning. She was spoken very little, did not make long sentences. It presented alterations in neuroimaging.

Conclusion: After understanding the definition of the disorder, which involves a change in neurodevelopment, whether in the brain anatomy or due to a deficiency in the neuronal circuit, it is noted that even though the diagnosis is clinical, in some cases—including the reported case—the diagnosis imaging can also help to understand possible behavioral changes due to an anatomical abnormality.

Keywords: Autism spectrum disorder, Autistic disorder, Diagnostic imaging, Neurodevelopmental disorders

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INTRODUCTION

According to the Diagnostic and Statistical Manual of Mental Disorders, autism spectrum disorder (ASD) is a pathology related to neurodevelopment characterized by difficulties in social interaction, communication, and repetitive and restricted behavior [1]. Such characteristics can be of different intensities, which grade ASD from mild to severe. This disorder is related to damage in neurological development, which involves anatomical variations and deficits in neural circuits. Its etiology remains unknown, but some studies relate the incidence of ASD to environmental factors, such as infections or the

use of certain drugs during pregnancy, or hereditary issues, such as the inheritance of a recessive gene from parents [2]. Some studies have revealed anatomical and functional alterations of the temporal lobes bilaterally in autistic patients, which justifies the symptomatology related to the deficit in the ability to interact with other people. In addition to this change, there is also a hypoactivation of regions responsible for the perception of faces and voices and social cognition [3]. Epidemiologically, according to data from the World Health Organization (WHO), there is 1 case of autism in every 160 children born worldwide. According to studies carried out to visualize the incidence of ASD in the world, it was noted that the number of individuals diagnosed increased globally, which may be related to the improvement in diagnoses made by doctors and awareness of the subject. It is calculated in Brazil that in 2014, of the 200 million inhabitants, approximately 2 million were autistic, 1% of the total population. In Brazil, in 2010, there were an estimated 500,000 people with autism [2].

When dealing with the restricted interest of some patients with autism spectrum disorder, it is noted that there is an excessive adherence to specific themes or objects that vary in intensity depending on each patient and each object or character, as in the clinical case of the study the fascination by fairytale princesses. These enchantments may be related to hypo- or hyper-reactivity to sensory stimuli due to the exacerbated response to specific sounds and textures, which make them addicted to this stimulus [4, 5]. These stimuli, instead of being reduced or annulled by the tutors in order to remove the patient's addiction and make him interested in other subjects, can be stimulated even more, as it is in these objects of interest that the individual will better develop motor skills, emotional understanding, sensory acuity, and social skills [5, 6].

CASE REPORT

JAD, 17 years old, is a student without comorbidities. She had been diagnosed with Autistic Spectrum Disorder, Cognitive Deficit, and Epilepsy. At 14 months, he started convulsive crises that were difficult to control, about four episodes daily. At the time, all complementary exams were standard, except for a slight thinning of the corpus callosum. Neuropsychomotor development slowed down for years. She was illiterate. She is currently using divalproatro sodium 250 mg 2× a day, levetiracetam 125 mg 2× a day, and lamotrigine 50 mg 2× a day. About ten months ago, she started obsessing over a specific fairy tale character (Snow White). She put herself in the character's shoes and suffered from “supposedly” not receiving visits from the entire group that made up the fairy tale. She constantly searched for photos on her cell phone in search of dialogues with the members of the story. The fact reached a growing gravity that, in the act of trying to help her, the family hired the alleged character twice.

Another point worth mentioning was the fact of holding the cell phone for hours, glimpsing at the character, and waiting for a response. She rarely hid out with teddy bears and seemed to pursue her sexuality. Extreme difficulty in physical contact, including with parents. The gaze was also another factor that deserved to be highlighted.

She started seizures at one year and two months, currently, well controlled with medication. She had a severe cognitive delay. Disjointed reasoning, she spoke very little and did not make long sentences. She was changing her behavior with fixed ideas.

Magnetic resonance imaging (NMR) showed alterations in the corpus callosum (Figure 1A), bilateral temporal and parietal cortical thickening (Figure 1B and C), badly rotated hippocampus (Figure 2), reduction in the thickness of the left longitudinal fasciculus (Figure 3A and B) and also an increase in glutamine and glutamate in cerebellar spectroscopy (Figure 4).

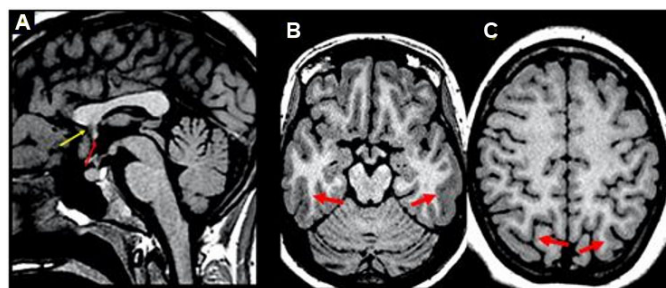


Figure 1: (A) Corpus callosum formation deficiency, not showing the rostrum (yellow arrow). Note compensatory hypertrophy of the anterior commissure (red arrow). (B) and (C) Bilateral temporal and parietal cortical thickening. Note the reduction in parietal cortical thickness with secondary widening of the sulci. Consistent with dysplasia.

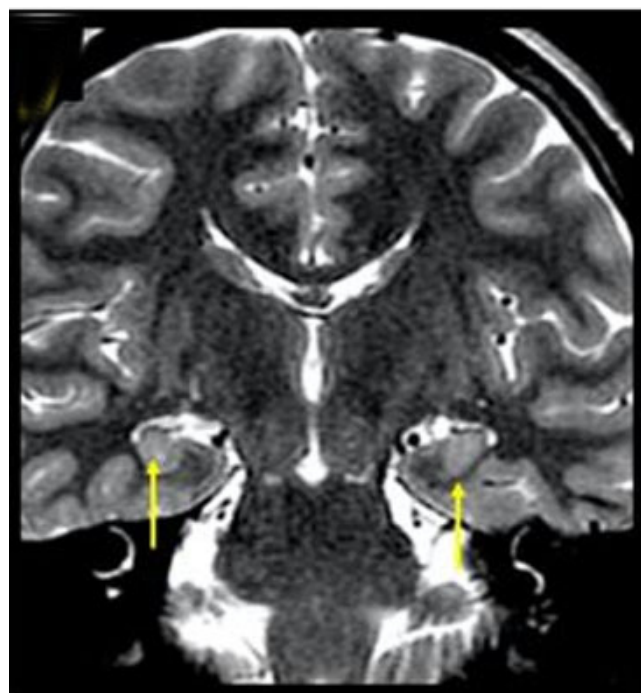


Figure 2: Hippocampi poorly rotated, vertical/globose in appearance.

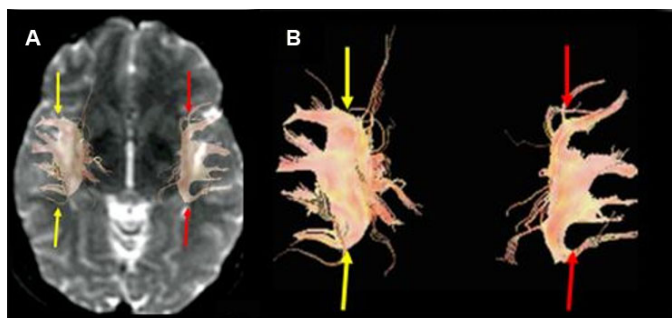


Figure 3: (A) and (B) Reduction in the thickness of the left superior longitudinal/arcuate fasciculus (red arrows) compared to the right one (yellow arrows), characterizing impairment of the language area, which is highly prevalent in ASD.

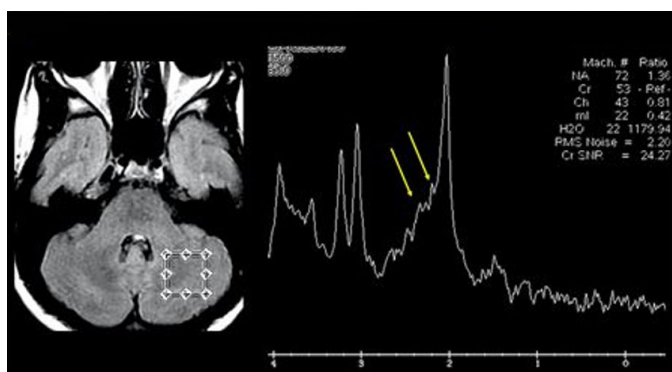


Figure 4: Spectroscopy of the cerebellum showing an increase in glutamine and glutamate (Glx), a highly prevalent finding in ASD (arrows).

DISCUSSION

Autism Spectrum Disorder (ASD) is an invasive neurodevelopmental pathology characterized by poor communication, social interaction, and repetitive and stereotyped behaviors [7, 8]. Its etiology remains unknown. However, studies indicate that the occurrence of ASD is related to genetic and environmental factors at the beginning of neurological development.

The diagnosis of ASD is clinical and based on specifiers, and criteria that characterize the symptoms of autism, such as the age of first concern, with or without loss of established skills and severity, thus allowing individualization in the clinical description of the patient [4]. The patient reported it had slowed neuropsychomotor development for years, disconnected reasoning, speech difficulty, and fixation on fairy tales.

Studies show that brain regions may be related to the development of the pathology, such as changes in the cerebellum, hippocampus, basal ganglia, and corpus callosum. Deficiency of the corpus callosum, the rostrum not being demonstrated. Another finding presented in the case is the increase of glutamine and glutamate (Glx); studies of proton magnetic spectroscopy (MRS) suggest a possible increase in Glx in the striatum of patients with ADHD, Obsessive Compulsive Disorder (OCD), and Autistic Spectrum Disorder [9–11].

A large part of the population with ASD has a concomitant intellectual disability (IQ < 70) due to language problems, causing difficulties in verbal and non-verbal communication. The anatomical and functional alterations of the temporal lobes bilaterally are related to the deficit in the ability to interact and social communication. A reduction in the thickness of the superior longitudinal/arcuate fasciculus explains the impairment of the language area [6, 8, 11].

Studies point out that hypo- or hyper-reactivity to sensory stimuli gives patients with autism a kind of addiction to these stimuli since they have an exacerbated response to sounds and textures [4]. In the clinical case described, it is possible to notice an obsession with a character specific to fairy tales (Snow White).

The fascination with the patient's Snow White in the report shows that each person with autism spectrum disorder has their attention focused on something, and it is extremely important not to interrupt or prohibit this contact, as it is precisely in this relationship that the patient is able to maintain social interaction and also find your point of calm. However, there is still nothing in the literature that talks about the fairy tale obsession being able to be used positively to improve the concentration, attention and skills of the patient, with possible future studies that discuss this issue.

Repetitive behavior is characteristic of autism spectrum disorder and can vary in type and severity. Sometimes, when the routine of activities is interrupted, it can provoke aggressive behavior and disobedience [11]. In the reported case, the patient repeatedly holds the cell phone for hours, glimpsing Snow White.

CONCLUSION

After reading the case and studying a series of works of literature, it is noted that the fascination with fairy tales, as well as with other characters and/or objects, is common in autistic patients, the choice of this enchantment being random. Thus, this report highlighted the alterations in neuroimaging, some common in the autistic spectrum, others not so much, thus relating the fixation on princesses and also his entire picture of autism.

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Author Contributions

Esther Gomes Andrade Figueiredo da Silva – Conception of the work, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Luiza Eyer Leme – Conception of the work, Acquisition of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Daniel Antunes Pereira – Conception of the work, Design of the work, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that

questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Marco Antônio Orsini Neves – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Antônio Marcos da Silva Catharino – Conception of the work, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

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Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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