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Autism Spectrum Disorder in Children and Adolescents with Type 1 Diabetes Mellitus

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition with increasing prevalence (affecting 1 in 100 people according to Autism Europe, and 1 in 36 children according to the U.S. Centers for Disease Control and Prevention — CDC). Its first symptoms appear before the age of 3. ASD represents a divergence in neurodevelopment that persists throughout a person's life, although the symptoms and the way they are expressed evolve over time. It is characterized by a qualitative impairment in social interaction—such as difficulties with eye contact, nonverbal communication, inability to form relationships, and a lack of spontaneity and reciprocity in social exchanges—as well as the presence of restricted, repetitive, and stereotyped patterns of behavior, interests, and activities. These often manifest as inflexible or repetitive actions. Among individuals with ASD, there is a wide range of language abilities (from nonverbal individuals to those with highly developed language skills), as well as diverse intellectual capacities (ranging from intellectual disability to high cognitive ability).

Although the presence of type 1 diabetes mellitus (T1DM) has been associated with an increased risk of mental health issues such as depression, anxiety, or eating disorders, current scientific evidence suggests there is no direct causal relationship between T1DM and ASD, or vice versa. However, given the increasing number of children and adolescents diagnosed with T1DM each year—with a prevalence estimated at 0.18 per 100 individuals younger than 15 years—and the above-mentioned ASD prevalence rates, the coexistence of both conditions will become increasingly common in clinical practice. The simultaneous presence of both conditions poses significant challenges for clinical management, requiring a tailored approach focused on the patient's individual needs.

MEDICAL CONDITION MANAGEMENT IN ASD

People with ASD tend to present a higher number of underlying conditions (those present from birth and inherent to the disorder, such as Angelman or Fragile X syndromes) and intercurrent conditions (not directly related to ASD) than neurotypical individuals.

Studies have shown that individuals with ASD have higher rates of mental health disorders (such as ADHD, conduct disorder, or anxiety), neurological disorders (such as epilepsy), as well as ophthalmologic, GI, and immunological conditions (3). In addition to presenting more comorbidities, these are often more difficult to diagnose and treat due to the intrinsic characteristics of ASD:

- Many patients struggle to attend hospitals or health care centers due to sensory hypersensitivities (auditory, visual, etc.), as these environments are typically overstimulating.
- Some have altered perceptions of pain and other bodily sensations, delaying the identification of symptoms.
- Leaving their usual environment and experiencing changes in routine can be distressing, requiring structured support to manage these transitions.
- Communication and comprehension difficulties may hinder medical examinations and diagnostic testing. Expressive language limitations can make it hard for patients to describe symptoms or experiences.
- Many health care and educational settings still lack specific training in how to care for neurodivergent individuals, leaving professionals to seek additional education on their own.

In response, several hospitals have developed adaptation programs to better accommodate people with ASD in healthcare environments (4). For instance, in 2016, Hospital Universitario Puerta de Hierro in Majadahonda (Spain) launched a health care program for individuals with ASD within its service area. This initiative is based on cross-departmental collaboration, in which a mental health nurse provides support and coordination among professionals from various medical specialties involved in trea- »

THE COMBINED MANAGEMENT OF ASD AND T1DM IN A SINGLE PATIENT IS CHALLENGING, AND IT IS RECOMMENDED TO USE A COORDINATED MULTIDISCIPLINARY APPROACH INVOLVING PROFESSIONALS FROM ENDOCRINOLOGY, PEDIATRIC NEUROLOGY, AND MENTAL HEALTH, AS WELL AS COORDINATION WITH SCHOOLS

TIPS FOR CARING FOR PATIENTS WITH ASD

- Every person with ASD is different.
- Minimize waiting times and ensure they occur in a calm, low-stimulus environment.
- Prepare in advance: explain your role and the purpose of the intervention before beginning.
- Listen to the caregiver.
- Use visual supports.
- Use literal language, short sentences, and avoid metaphors.
- Speak in a calm tone of voice.
- Be patient: sometimes more time is needed to ensure a positive experience.

IN MANY PATIENTS WITH ASD, A TARGETED NUTRITIONAL INTERVENTION IS NECESSARY TO ADDRESS SENSORY-RELATED FEEDING DIFFICULTIES, AS THEY OFTEN EXPERIENCE ISSUES WITH FOOD TEXTURES, COLORS, AND FLAVORS

WHEN CARING FOR A CHILD OR ADOLESCENT WITH ASD AND T1DM, IT IS IMPORTANT TO CONSIDER:

-Difficulties with proprioception: these patients may find it harder to identify symptoms such as polyuria, polydipsia, fatigue, or dizziness.

- Due to language difficulties, they may be unable to express symptoms like thirst, increased urination, or general discomfort.

- Issues related to sensory hypersensitivity: new sensory stimuli from technology can lead to resistance to change, distress, and confusion, requiring a specific approach.

- Problems with eating habits, restrictions, and fixations: many patients experience challenges with food textures, colors, or smells, leading to a highly restricted diet.

- Unexpected glycemic fluctuations can be difficult for some individuals with ASD to tolerate and may result in significant anxiety or behavioral disturbances.

- Rigidity and adherence to routines can make adapting to lifestyle changes after a diabetes diagnosis and treatment adjustments particularly challenging.

- The clinical management is further complicated by the high frequency of comorbidities, both medical and psychiatric.

CLINICAL PICTURE

A 4-year-old boy is referred for evaluation due to difficulties in social interaction and a history of T1DM diagnosed at 27 months of age following an episode of diabetic ketoacidosis. He is currently using an insulin pump with a continuous glucose sensor. He exhibits clear difficulties with socialization, showing no interest in other children but intense interest in numbers and letters. The parents attribute his difficulties to the context of pandemic-related isolation and to his diabetes diagnosis. Therefore, a specific ASD evaluation was conducted, including complementary diagnostic tools such as the ADOS-2 (9). The child showed restricted interests, lack of reciprocity, stereotyped play, rigidity, difficulties with eye contact, limited gesturing, and poor tolerance to changes, among other features. Despite the clear presence of symptoms consistent with ASD, the parents had significant difficulty accepting the diagnosis. Ongoing support was necessary to help them recognize their child's specific needs and respond appropriately.

» ting patients with ASD. This collaborative network aims to enhance medical care by prioritizing the humanization of healthcare, aligning with the hospital's broader humanization initiative. In the case of patients with comorbid T1DM, they also benefit from the hospital Liaison Consultation Program, through which they receive follow-up care as needed in collaboration with the endocrinology team. This approach follows recommendations suggesting that mental health professionals should be integrated into the comprehensive care of patients with T1DM (5).

ASD + T1DM

The combined management of ASD and T1DM presents a clear clinical challenge. A coordinated multidisciplinary approach is essential, involving endocrinology, pediatric neurology, and mental health professionals, as well as ongoing communication with the patient's school. Although some studies have explored shared genetic factors between autism and autoimmune diseases, the evidence for a direct association between ASD and T1DM remains inconclusive. Prevalence rates of T1DM appear to be similar in both ASD and neurotypical populations (6).

RECOMMENDATIONS

Of note, every individual with ASD is unique, making it essential to understand each patient's specific needs, challenges, and strengths to optimize clinical care. Listening to caregivers or family members is crucial, as they can provide insight into the patient's baseline behavior and likely responses. General recommendations include explaining medical procedures in advance, »

INVOLVING PARENTS OR CLOSE FAMILY MEMBERS IN THE PROCESS CAN BE VERY HELPFUL, AS THEIR PRESENCE AND SUPPORT CAN PROVIDE A SENSE OF CALM AND REASSURANCE

» using visual supports (available on websites such as ARASAAC) (7); communicating clearly and empathetically, using visual aids and simple language; consider using Augmentative and Alternative Communication (AAC) systems, such as picture symbols or tablets, depending on the tools the patient typically uses. The use of short, literal sentences with a calm tone of voice, avoiding figurative language, and check for understanding is highly recommended.

Many patients with ASD require nutritional interventions that address sensory-related challenges, including issues with food textures, colors, or flavors. These sensory sensitivities must be considered when offering dietary advice for patients with comorbid T1DM.

Considering the difficulties many patients have in identifying symptoms related to glucose level imbalances—and the fact that these changes can sometimes manifest as behavioral problems—it is crucial to closely monitor glucose »

» levels and adjust treatment as needed (8). Therefore, blood tests and subcutaneous sample collections are frequent, which at times leads to highly stressful situations for patients, families, and professionals due to how difficult these extractions can sometimes be. As a result, coercive techniques are occasionally used in practice, including physical restraint of patients. This can create traumatic situations that complicate future extractions, hinder treatment adherence, and make long-term follow-up more difficult. Given how often these patients must undergo sample collection, it is essential to ensure these procedures are carried out in the best possible way for patients and their families. To achieve this, several key points must be considered. First, as previously mentioned, when caring for a patient with ASD, it is important to conduct preparatory work with both the patient and the family, incorporating primary caregivers into the multidisciplinary approach. To avoid coercive situations, it is advisable to engage in anticipatory preparation using pictograms and the actual materials that will be used during the procedure. We recommend that patients be familiar with each step of the procedure in advance, following the exact sequence without modifications, and that the experience should not be minimized or the pain from the needle dismissed. If the blood draw is complex, patients may benefit from additional strategies, such as the "koala technique." This is a method used in our center for blood collection in complex ASD patients—for example, nonverbal children or those with severe interaction difficulties who may become anxious during the procedure. In this technique, the mother or a family member hugs the child chest-to-chest, which is similar to how a koala clings to a tree. This embrace provides the child with a sense of safety and calm, which can help make the blood draw less traumatic. In addition to the embrace, it is essential to create a calm and predictable environment, where the patient has also been familiarized with the procedure beforehand at home or at school. Involving parents or close family members in the process can be extremely helpful, as their presence and support can provide a sense of calm and reassurance. These strategies not only improve the patient's experience but also enhance the experience for healthcare professionals, allowing medical and nursing procedures to be carried out more efficiently and humanely. Despite these considerations, for these patients, the use of continuous glucose monitors (CGM), insulin pumps, or hybrid closed-loop systems can be especially useful to help ensure stable blood glucose levels. D

CONCLUSIONS

Although the prevalence of T1DM in individuals with ASD is similar to that of the general population, the intrinsic characteristics of ASD present unique challenges in clinical care. Addressing these challenges requires tailored communication, anticipatory strategies, psychoeducational work, and a multidisciplinary approach.

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