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Research Article

Clinical follow-up of five children with autism spectrum disorder using full spectrum cannabis oil as a complementary therapy: a case series

Acompanhamento clínico de cinco crianças com transtorno do espectro autista que usam óleo de cannabis full spectrum como terapêutica complementar: uma série de casos

Seguimiento clínico de cinco niños con trastorno del espectro autista utilizando aceite de cannabis de espectro completo como terapia complementaria: una serie de casos

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Abstract

Introduction: Autism Spectrum Disorder (ASD) is characterized by communication and social interaction deficits, along with repetitive and restrictive behaviors, typically emerging around age three. **Objectives**: To assess the therapeutic response of five pediatric patients with ASD using full-spectrum cannabis oil rich in cannabidiol (CBD) 20 mg/ml combined with conventional pharmacotherapy, monitored in Primary Health Care during the first half of 2024. **Methods**: An observational, descriptive case series study was conducted through active review of digital medical records. Validated tools for diagnosis and clinical assessment (Childhood Autism Rating Scale - CARS and Autism Treatment Evaluation Checklist - ATEC) were applied, along with a semi-structured script based on the Case Report (CARE checklist) to collect essential information on the clinical evolution of patients using complementary cannabis oil therapy. **Results**: The sample included three boys and two girls, aged 5 to 11 years. Two were classified with severe autism and three with mild to moderate autism. Mean age at diagnosis was 42.6 months, and average CBD use was 7.4 months. All patients experienced significant improvement in symptoms such as aggression, insomnia, hyperactivity, social interaction, repetitive behaviors, food selectivity, and concentration. Concomitant medications included risperidone, chlorpromazine, lamotrigine, and topiramate, with risperidone being the most common. **Conclusion**: CBD-rich cannabis oil showed positive therapeutic effects in patients with persistent ASD symptoms, with no adverse events reported after its introduction.

Keywords: Primary health care; Cannabis; Medical marijuana; Drugs for primary health care; Autism spectrum disorder.

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Resumo

Introdução: O Transtorno do Espectro Autista (TEA) caracteriza-se por déficits na comunicação e na interação social, além de comportamentos repetitivos e restritivos, geralmente manifestados por volta dos 3 anos. **Objetivos**: Avaliar a resposta terapêutica de cinco pacientes pediátricos com TEA que utilizaram óleo de cannabis full spectrum rico em canabidiol (CBD) 20 mg/ml associado ao tratamento medicamentoso convencional, acompanhados na Atenção Primária à Saúde no primeiro semestre de 2024. **Métodos**: Realizou-se um estudo observacional e descritivo, do tipo série de casos, baseado em busca ativa em prontuários digitais. Utilizaram-se instrumentos validados para diagnóstico e avaliação clínica (Childhood Autism Rating Scale - CARS e Autism Treatment Evaluation Checklist - ATEC), além de roteiro semiestruturado fundamentado na Case Report (CARE checklist), permitindo a coleta de dados essenciais sobre a evolução dos pacientes que faziam uso complementar do óleo de cannabis. **Resultados**: Dos cinco pacientes, três eram meninos e duas meninas, entre 5 e 11 anos. Dois foram classificados com autismo grave e três com autismo leve a moderado. A média de idade ao diagnóstico foi de 42,6 meses, e o uso de CBD durou, em média, 7,4 meses. Todos apresentaram melhora expressiva em sintomas como agressividade, insônia, hiperatividade, interação social, comportamentos repetitivos, seletividade alimentar e concentração. As medicações associadas incluíram risperidona, clorpromazina, lamotrigina e topiramato, sendo a risperidona a mais utilizada. **Conclusão**: O óleo de cannabis rico em CBD demonstrou efeitos terapêuticos positivos em pacientes com sintomas persistentes do TEA, sem registro de eventos adversos relacionados ao seu uso inicial.

Palavras-chave: Atenção primária à saúde; Cannabis; Maconha medicinal; Medicamentos para a atenção básica; Transtorno do espectro autista.

Resumen

Introducción: El Trastorno del Espectro Autista (TEA) se caracteriza por déficits en la comunicación y en la interacción social, además de comportamientos repetitivos y restrictivos, generalmente manifestados alrededor de los 3 años. **Objetivos**: Evaluar la respuesta terapéutica de cinco pacientes pediátricos con TEA que utilizaron aceite de cannabis full spectrum rico en cannabidiol (CBD) 20 mg/ml junto con la farmacoterapia convencional, atendidos en la Atención Primaria de Salud durante el primer semestre de 2024. **Métodos**: Se realizó un estudio observacional y descriptivo, tipo serie de casos, basado en la revisión activa de historias clínicas digitales. Se emplearon instrumentos validados para diagnóstico y evaluación clínica (Childhood Autism Rating Scale - CARS y Autism Treatment Evaluation Checklist - ATEC), además de un guion semiestructurado basado en la Case Report (CARE checklist) para recopilar información sobre la evolución de los pacientes que utilizaban el aceite de cannabis complementariamente. **Resultados**: Tres pacientes eran niños y dos niñas, con edades entre 5 y 11 años. Dos fueron clasificados con autismo grave y tres con autismo leve a moderado. La edad media de diagnóstico fue de 42,6 meses y el uso promedio de CBD fue de 7,4 meses. Todos mostraron mejoría significativa en agresividad, insomnio, hiperactividad, interacción social, conductas repetitivas, selectividad alimentaria y concentración. Las medicaciones asociadas incluyeron risperidona, clorpromazina, lamotrigina y topiramato, siendo la risperidona la más frecuente. **Conclusión**: El aceite de cannabis rico en CBD mostró efectos terapéuticos favorables en pacientes con síntomas persistentes del TEA, sin eventos adversos relacionados con su inicio.

Palabras clave: Atención primaria de salud; Cannabis; Marihuana medicinal; Medicamentos para atención básica; Trastorno del espectro autista.

INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in communication and social interaction, as well as repetitive and restrictive behaviors.[1] Symptoms typically arise in early childhood, with a higher incidence around the age of 3, and diagnosis can be established from 18 months of age. Patients with ASD may exhibit irritability, anxiety, and challenging behaviors, affecting not only themselves but also their families and social circles.[2,3]

Risk factors include having a sibling with ASD, a family history of mental disorders, advanced parental age, low birth weight, and hospitalization in an Intensive Care Unit (ICU). Although these factors may be associated with ASD, its etiology is not completely understood, likely involving a combination of genetic and environmental factors. Studies indicate that the concordance rate of ASD is higher in identical twins than in fraternal twins, reinforcing the genetic influence.[4-6]

Early warning signs may include motor difficulties, resistance to social interaction, and attention problems. Early identification and specialized intervention are crucial for optimizing development, harnessing the brain's plasticity in children.[2] According to data from the Centers for Disease Control and Prevention (CDC),[7] in 2020, 1 in every 36 children aged 8 was diagnosed with ASD in the United

States, with a higher prevalence in boys. In Brazil, estimates indicate around 2 million autistic individuals, representing approximately 1% of the population.[8]

ASD has no cure, but treatment focuses on managing symptoms through multidisciplinary interventions and, when necessary, pharmacotherapy. In João Pessoa, this non-pharmacological support is provided through institutions such as the Integrated Support Center for People with Disabilities Foundation (FUNAD) and the Municipal Reference Center for Inclusion for People with Disabilities (CRMIPD), which offer rehabilitation for children and young people with ASD, providing various services.[9,10]

The most common medications for controlling symptoms in children with ASD include risperidone and aripiprazole, which aim to reduce irritability. Both are antipsychotics with well-known side effects, such as weight gain and metabolic syndrome. Methylphenidate is used in cases associated with Attention Deficit Hyperactivity Disorder (ADHD).[3,4] However, many patients do not respond adequately to these medications, leading to the search for alternative therapies. Phytocannabinoids, especially cannabidiol (CBD), emerge as a promising option, as CBD has therapeutic potential without the psychoactive effects of tetrahydrocannabinol (THC).[2,3,5]

Therefore, this study aims to collect clinical data and therapeutic response from five pediatric patients with Autism Spectrum Disorder, using full spectrum cannabis oil rich in CBD 20 mg/ml as complementary therapy, assisted at the Primary Health Care between 2022 and 2024.

METHODS

This is an observational and descriptive clinical study, consisting of a case series, conducted at the Family Health Unit (FHU) *Mudança de Vida*, in the Gramame neighborhood, belonging to Health District II, in the area between João Pessoa and Conde, in Paraíba. The study's sample comprises five patients diagnosed by neurologists at FUNAD with childhood autism (ICD-10 F84.0), using full spectrum cannabis oil rich in CBD 20 mg/ml as a therapeutic adjunct for symptom control, purposefully selected during consultations with the physician participating in the research during the first semester of 2024.

As inclusion criteria, the following were considered: having a diagnosis of Autism Spectrum Disorder; being in the pediatric age group; being a patient of the physician participating in the research; and using *cannabis* oil as a complement to pharmacological treatment. For data collection, an active search was conducted in the medical records of the selected patients. Thus, the data were gathered by verifying documents and records of the consultations conducted by the responsible physician. The information of interest included: age, gender, history of current illness, preferred treatments, and response to the adopted therapy. After the end of data collection, the use of the medical records was immediately discontinued.

In addition, validated questionnaires were used to assess the diagnosis, as well as a structured guide for conducting a guided interview, focusing on the most important information to understand the history of patients with ASD, the pathways taken, and the outcomes achieved with the use of cannabis oil. There are no validated research protocols to study these specificities in this patient profile.

Therefore, a semi-structured interview developed by the authors was used, containing questions for the child's legal guardian, based on the Case Report (CARE checklist) and points from the Autism Treatment Evaluation Checklist (ATEC), in order to provide more support for this authorial questionnaire.

Moreover, the patients were evaluated based on the application of the Childhood Autism Rating Scale (CARS) to classify them as: no autism (15–30), mild to moderate autism (30–36), and severe autism (36–60), according to the analysis of the patients' current condition. The result of this score was compared

to the data from the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5) to classify the level of support needed for these children.

When conducted well, interviews allow for in-depth analysis and contribute to the gathering of consistent information that enables the description and understanding of the logic governing relationships within the studied group, being essential for mapping practices of specific social universes.[13]

On the other hand, the reliance on interviews weakens the results of the study, as it involves information bias (memory and response), depending on recall narratives and the accuracy of the cases. Additionally, there is a selection bias, since all the patients included in the research showed good responses to the use of cannabis oil, making it impossible to provide a comparative counterpoint to the adoption of this therapy as a complement.

For the collected data's storage and systematization, tables were created in Google Sheets in order to later compare them with the current literature on the subject.

The study adhered to all ethical aspects, with the signing of the Informed Consent Form (ICF) by the legal guardians of the selected patients. In addition, it was submitted for review to the Research Ethics Committee of the Health Sciences Center at the Federal University of Paraíba (CEP/CCS/UFP), with Ethical Assessment Presentation Certificate (CAAE) No. 80434724.4.0000.5188, approval report No. 6,966,704, and Letter of Consent from the USF *Mudança de Vida*, with process number 111.128/2024.

RESULTS

Case 1 and case 2

The patients in question are seven-year-old identical twins from João Pessoa, Paraíba, both diagnosed with childhood autism at the age of three. The following reports describe their treatment experiences.

Case 1

Diagnosed with ASD at three years old, she initially did not use medications, receiving psychological and speech therapy at FUNAD. Upon turning six, she began to show irritability, hyperactivity, and aggressive behaviors, impacting her school attendance. The medication treatment she started included fluoxetine, topiramate, and chlorpromazine, but the symptoms persisted.

In search of a solution, the mother consulted the psychiatrist at CRMIPD, who recommended the introduction of *cannabis* oil. Before starting, C1 was using risperidone and other medications until, after hearing another mother speak about a doctor prescribing *cannabis* oil, C1's mother decided to learn more about this new therapeutic option and sought guidance in a medical consultation with the referred professional. In June 2023, C1 began complementary treatment with *cannabis* oil, gradually discontinuing chlorpromazine without noticing any adverse effects.

She started with six sublingual drops of full-spectrum *cannabis* oil rich in CBD (20 mg/ml), gradually increasing to 20 daily drops. At the time of the research, after 10 months of use, significant improvements were reported: the daughter's communication improved, as she began to follow commands and express her needs. Additionally, her agitation reduced, and both self-aggression and aggression towards others ceased. Despite these improvements, C1 has a CARS score of 39, categorizing her as having severe autism.

Case 2

Diagnosed with ASD at three years old, she began medication therapy at six years with fluoxetine and topiramate. The treatment was initially effective, but after a year, C2 started crying excessively and showing aggression, leading to adjustments in the doses and the inclusion of lamotrigine.

After two months, the use of *cannabis* oil was suggested, starting with three daily drops and increasing to 27 drops (9-9-9), while fluoxetine was discontinued. The doses of lamotrigine were also adjusted. Since starting the use of the oil, C2 has shown improvement in irritability, hyperactivity, and concentration.

At the time of the research, she had been continuously using *cannabis* oil for eight months, starting in August 2023. The mother had no resistance to the treatment, already knowing of cases with good responses. Currently, C2 has a CARS score of 30, placing her on the threshold between no autism and mild to moderate autism.

These cases demonstrate the efficacy of using *cannabis* oil in modulating symptoms of ASD, especially in patients who have not responded to conventional treatments. The experiences of C1 and C2 highlight the importance of personalizing therapeutic approaches and the need for more research on alternative interventions in the management of autism.

This family obtains the oil for free through a social exemption program by the Brazilian Association for *Cannabis* Support and Hope (ABRACE), which was the first non-profit cultivation association in Brazil to gain legal support for the planting, production, and supply of *cannabis*-derived products for its members. However, the mother reiterates, with concern, that she only has the right to four more months of free access and fears that after this period, she may lose her access to treatment due to financial constraints. It is worth noting that when asked about her initial perspective on using a medication derived from *cannabis*, she reported that there was no resistance, as she was already aware of its benefits from knowing other people who used it and had positive responses. She expressed great satisfaction with the use of the medications because, during crisis periods, C2 did not even want to attend consultations.

Case 3

The patient is a 10-year-old mixed-race boy from Santa Rita, residing in João Pessoa, Paraíba. Diagnosed with ASD at three years and seven months, he began non-medication treatment with psychologists and speech therapists, as well as activities like swimming. He exhibited typical behaviors of autism, such as stacking objects, repetitive movements, difficulty responding when called, speech delays, and walking on tiptoes.

Based on the initial suspicion, the mother took him to a speech therapist when he was one year and six months old, and they began investigating for hearing deficits. After confirming normal hearing, the patient was evaluated at FUNAD for eight months, resulting in a diagnosis of ASD in 2017. At seven years old, due to increased anxiety and aggressive behaviors during the pandemic, he started using risperidone, initially at doses of 0.5 mL every 12 hours, which were later increased to 1 mL. Other medications, such as imipramine and chlorpromazine, also did not show significant efficacy.

With the use of risperidone in monotherapy, he did not experience negative effects, but there was also no improvement in the most significant symptoms for the patient. The same was observed when using chlorpromazine, which led a staff member at FUNAD to suggest that the mother should research about *cannabis* oil, mentioning the *Cannabis* Association Florescer (ACAFLOR) and the Brazilian Association for *Cannabis* Support and Hope (ABRACE).

Upon recommendation from ABRACE, she found a family doctor (FD) who prescribed medicinal *cannabis* and began seeing him. In August 2023, she started using the oil, showing no resistance or fear regarding the *cannabis*-based medication, as she was hopeful for the possibility of her son's improvement.

During the consultation, the doctor realistically clarified that the introduction of the oil would be an attempt to improve the child's quality of life, but it would not work in a miraculous way. Based on a joint therapeutic decision, they agreed to try it and started treatment with nine drops (3-3-3), reaching a daily dose of 16 drops (8-0-8). Chlorpromazine was maintained at 25 mg (1-1-1), administered one hour after the *cannabis* oil to avoid drug interactions.

After the introduction of the oil, C3 significantly reduced hyperactivity crises, which decreased from daily occurrences to about two per month. Additionally, there were advancements in language and improvements in sleep. Currently, he has a CARS score of 31, classifying him as having mild to moderate autism, which suggests a significant improvement in his condition following the *cannabis* oil introduction in his treatment.

Case 4

The patient is an 11-year-old mixed-race boy, born and residing in João Pessoa, Paraíba. Diagnosed with ASD in September 2023, he exhibited hyperactivity, learning deficits, attention deficits, rapid forgetfulness, and speech delays. Although he started developing language normally, he faced difficulties with more complex speech. These signs emerged around the age of three.

At the age of 10, he was referred to FUNAD by a psychologist, where a neurologist suggested the diagnosis of ASD. The initial treatment included risperidone 1 mg/ml, administered at 0.5 mL every 12 hours. Although there was a slight improvement in concentration and hyperactivity, the patient developed food compulsions, resulting in a weight gain of two kilograms per week, as well as sleep disturbances.

During a consultation at the FHU, childhood obesity was diagnosed. To optimize the treatment, lamotrigine 25 mg was added (1-0-1). In this context, the doctor suggested therapy with *cannabis* oil, as he observed the patient to be very impatient, anxious, and inattentive. Thus, the doctor who was following him at the FHU presented this alternative as an option to be considered together with the family, clarifying any possible doubts.

Cannabis oil rich in CBD (20 mg/ml full spectrum) was then prescribed, with three sublingual drops every eight hours, increasing by one to two drops weekly if needed. The family obtained the oil for free through ABRACE's exemption program, with the report provided by the doctor describing their low-income social profile, which facilitated appropriate therapeutic adherence.

After starting the oil, the patient showed improvement in behavior and sleep, although food compulsions and weight gain persisted. Risperidone was gradually reduced. The patient receives psychological follow-up and, despite the treatment, still presents with level 2 autism and a CARS score of 47, indicating severe autism.

The mother had no prior experience with *cannabis* oil but did not hesitate to start the treatment, focusing on her son's improvement. She reported no side effects, and at the last consultation, the dose was increased to five drops every eight hours to help reduce the risperidone and control the symptoms.

Case 5

The patient is a 5-year-old mixed-race boy, born and residing in João Pessoa, Paraíba. He was diagnosed by a neurologist at FUNAD in 2019, when he was one year and two months old. The mother

suspected the disorder in his first year of life due to speech delays, avoidance of eye contact, and rejection of certain food textures. Over time, the situation worsened, showing behaviors such as walking on tiptoes, hyperactivity, aggression, and hypersensitivity to sounds.

Initially, the patient did not use medication, only a natural flower remedy. After realizing that it was not enough, the mother consulted a neurologist, who prescribed chlorpromazine. However, this medication did not yield results, and the patient continued to experience sleep disturbances and difficulty coping with crowds and loud noises.

After four months of observation, the neurologist introduced risperidone and periciazine, but the symptoms persisted, even with dosage adjustments over the course of a year. Although there was a slight calming effect after multiple therapeutic adjustments, the child did not interact at school, remained very sensitive to sounds, and had food restrictions. Increasing the periciazine dose resulted in worsening aggression and agitation, making it difficult for him to interact with other children and with his mother.

In light of this situation, the occupational therapist at FUNAD suggested using the *cannabis* oil. Thus, the mother independently sought more information about this therapy, looking for other people who used the oil, and despite the high cost, she became interested in the alternative, as her son was being negatively affected at home, in school, and during multidisciplinary appointments.

Thus, in a consultation with the family and community doctor who prescribes medicinal *cannabis*, a horizontal and clear approach was taken regarding the doubts about cannabinoid therapy, outlining this therapeutic option's advantages and disadvantages. The FD also provided the necessary documentation to seek free access to the medication, considering the family's low income and the financial impossibility of maintaining the treatment.

In September 2023, the mother began treatment with ABRACE's full-spectrum *cannabis* oil rich in CBD (20 mg/ml), discontinuing periciazine and maintaining risperidone at 3 mL (1.5-0-1.5). She started with nine sublingual drops (3-3-3) and gradually increased to 21 daily drops (7-7-7), observing significant improvement.

The mother initially had concerns about using the oil because it was made from *cannabis*, but after sharing her insecurities with her husband, she decided to proceed. Currently, C5 has a CARS score of 33, classifying him as having mild to moderate autism.

In light of the cases presented, it is important to highlight all the signs and symptoms described by the mothers of each case, noting which of these signs and symptoms showed improvement after the introduction of the full-spectrum *cannabis* oil rich in CBD (20 mg/ml) in the medication therapy. In Chart 1, there is a key data summary from these reports.

It is also relevant to note that the family conditions were distinct; however, overall, the five families studied fall within a low-income context and largely depend on the Continuous Cash Benefit (CCB), according to the Organic Law of Social Assistance (LOAS) — Law No. 8,742/1993, amended by Law No. 12,470/2011, in accordance with the Public Policy of Social Assistance, ensuring income security. This benefit is intended for individuals with disabilities or illnesses that impair their ability to work as a means of financial support, amounting to one minimum wage per month, which does not require contributions from the recipient and can be requested at any branch of the National Institute of Social Security (INSS). The CCB has been granted since January 1996, and in December 2012, two million and twelve thousand active benefits for individuals with disabilities were recorded.[14]

Table 1. Summary of signs and symptoms that showed improvement after the initiation of full-spectrum CBD-rich cannabis oil (20 mg/ml) as a complementary therapy and duration of use since introduction, João Pessoa, Paraíba, Brazil, 2024.

	Current medications in use and duration of cannabis oil use (up to April 2024)	Emergence of interest and shared decision-making process	Signs presented since the onset of the condition	Signs improved after combined therapy
Case 1, 7-year-old female	Risperidone 1 mg (1-0-2) Lamotrigine 25 mg (1-0-0) Full-spectrum CBD cannabis oil 20 mg/ml, 8 drops (8-8-8) 10 months	Recommended by the psychiatrist at CRMIPD. Discussed with the family during a consultation at the USF.	Irritability, aggression, hyperactivity, sleep disturbances, lack of eye contact, rejection of physical touch, failure to follow commands, not pointing to indicate wants, only speaking 'mommy' and 'daddy,' and avoiding social interaction.	Irritability, hyperactivity, sleep disturbances, aggression, communication issues, failure to follow commands, not pointing to indicate needs, and avoiding social interaction.
Case 2, 7-year-old female	Lamotrigine 25 mg (2-0-0) Topiramate 50 mg (0-0-1) Full-spectrum CBD cannabis oil 20 mg/ml, 9 drops (9-9-9) 8 months	Recommended by the psychiatrist at CRMIPD. Discussed with the family during a consultation at the USF.	Irritability, aggression, lack of concentration, speech delays, and avoidance of social interaction.	Irritability, concentration, aggression.
Case 3, 10-year-old male	Chlorpromazine 25 mg (1-1-1) Full-spectrum CBD cannabis oil 20 mg/ml (8-0-8) 8 months	Recommended by a healthcare professional at FUNAD. Discussed with the family during a consultation at the USF.	Repetitive behavior, focusing more on objects than on people, walking on tiptoes, not responding to one's name, speech delays, insomnia, restlessness, and aggression.	Speech, insomnia, concentration, restlessness.
Case 4, 11-year-old male	Risperidone 1 mg/ml, 1.5 ml (0.75-0-0.75); Full-spectrum CBD cannabis oil 20 mg/ml, 5 drops (5-5-5); 4 months	Recommended by the family and community doctor (MFC) in Primary Care. Discussed with the family during a consultation at the USF.	Hyperactivity, learning deficits, attention deficits, rapid forgetfulness, speech delays, insomnia, aggression.	Hyperactivity, insomnia and aggression.
Case 5, 5-year-old male	Risperidone 1 mg/ml, 1.5 mL (1.5-0-1.5); Full-spectrum CBD cannabis oil 20 mg/ml, 7 drops (7-7-7); 7 months	Recommended by the Occupational Therapist at FUNAD. Discussed with the family during a consultation at the USF.	Speech delays, avoiding eye contact, rejecting certain foods with specific textures, walking on tiptoes, hyperactivity, aggression, sensitivity to sounds, and sleep disturbances.	Food selectivity, sleep disturbances, aggression, hyperactivity.

DISCUSSION

ASD originates in early childhood, but it is observed that children exhibit symptoms at different neurodevelopment stages. In some cases, symptoms are apparent in the first few months of life, although it is noted that ASD symptoms are consistently identified only between 12 and 24 months. Despite this, the diagnosis of ASD typically occurs at an average age of 4 or 5 years, which compromises early intervention. This presents a problematic scenario, as appropriate treatment initiated early is associated with significant gains in the child's cognitive and adaptive functioning. Thus, when the diagnosis is made correctly and the

necessary intervention is applied early, it is possible to prevent the full manifestation of ASD, as it coincides with a developmental period when the brain is highly plastic and malleable.[6,15]

Therefore, it is important to pay attention to some potentially determining markers in the first year of life, which include abnormalities in motor control, delays in motor development, decreased sensitivity to social rewards, negative affect, and difficulty in attention control.

Additionally, the Brazilian Society of Pediatrics (BSP)[6] has listed the suggestive alarm signs in the first year of life, which can be seen in Chart 2.

Table 2. Suggestive warning signs in the first year of life, João Pessoa, Paraíba, Brazil, 2024.

1. Loss of already acquired skills, such as babbling or pointing gestures, eye contact, or social smiling;
2. Not responding to sounds, noises, and voices in the environment;
3. Not showing social smiles;
4. Low eye contact and deficiency in sustained gaze;
5. Low attention to the human face (preference for objects);
6. Showing more interest in objects than in people;
7. Not following nearby objects and people in motion;
8. Little or no vocalization;
9. Not accepting touch;
10. Not responding to their name;
11. Poor imitation;
12. Low frequency of smiles and social reciprocity, as well as restricted social engagement (little initiative and low availability for response);
13. Unusual interests, such as fixation on sensory-visual-motor stimuli;
14. Unusual discomfort with loud sounds;
15. Moderate to severe sleep disturbances;
16. Irritability when held and low responsiveness during feeding

Source: Brazilian Society of Pediatrics.[6]

Chart 3 shows the enumeration of the signs presented by each patient. In this context, a formal neuropsychomotor development assessment is fundamental and indispensable, as part of the pediatric consultation. Therefore, in Chart 4, some of the alert signs for evaluation in child development monitoring can be consulted, according to the BSP.[6]

Table 3. Warning signs presented by patients in the first year of life, João Pessoa, Paraíba, Brazil, 2024.

	Warning sign
Case 1	2,4,7,8,10,14
Case 2	2,4,7,8,10
Case 3	2,4,6,8,10,14
Case 4	3,4,5,6,8,11,12,14
Case 5	1,2,4,5,6,8,9,10,11,12,13,14,15

It is a fact that the prevalence of ASD has increased exponentially: CDC research shows this increase over the past few decades, from 1 in 150 children in 2000 to 1 in 44 in 2018, and now 1 in 36 in the 2020 report, revealing an increase of approximately 317%[16] Therefore, many families have struggled to obtain a timely diagnosis for the necessary interventions due to the congestion of specialized services

in diagnosing and monitoring neurodevelopmental disorders. Thus, changes in the social communication and language domains, as well as repetitive behaviors between 12 and 24 months, have been proposed as markers for early autism identification. Although these clinical signs are often identified by most parents from the first year of life, children frequently only receive an ASD diagnosis in preschool or even school age. Late diagnosis and the consequent delayed intervention in children with ASD hinder their overall development.[17,18]

Table 4. Warning signs according to age in months, João Pessoa, Paraíba, Brazil, 2024.

	Warning signs
6 months	Few facial expressions; Low eye contact; Absence of social smile; Little social-communicative engagement.
9 months	Does not engage in communicative turn-taking; Does not babble “mama/dada”; Does not look when called; Does not look where the adult points; Imitation is limited or absent.
12 months	Absence of babbling; Does not use conventional gestures (such as waving to say goodbye, for example); Does not say “mama/dada,” absence of shared attention.
At any age:	Losso f skilss

Fonte: Sociedade Brasileira de Pediatria.[6]

This is shown by a recent study conducted in Brazil, where mothers indicated that their initial concerns regarding the atypical development of their children were: delays in verbal language, failure to respond to their names, lack of eye contact, and restlessness. These initial concerns occurred at an average age of 23.6 months, while the formal diagnosis was only established close to six years (59.6 months), which corresponds to an average significant delay of 36 months.[19]

This maternal concern is reaffirmed in all the patients evaluated in this study, as all five exhibited these signs at some point in childhood. Furthermore, early diagnosis was established only in patient C5 (one year and two months), while for the others — C1 and C2 (three years), C3 (three years and seven months), and C4 (ten years) — the average age at diagnosis was 42.6 months. In contrast, the mothers reported early suspicions. In the case of C5, the mother was concerned and sought specialized services at six months, while for C3, it was a bit later, at 18 months. The mother of C1 had her suspicion at 15 months, as did her twin sister, C2. Finally, the mother of C4 only had her suspicion at three years (36 months). Thus, there is an average suspicion age of 18 months, with the diagnostic delay for the patients in this study corresponding to 24.6 months.

This average delay of at least 36 months[19] has led to greater morbidity in patients, as early intervention is hindered, resulting in poorer utilization of neuronal plasticity in the early years of life. In light of this, it is essential to make a concerted effort for early detection to occur and to change the national reality.[6] The account that reaffirms this diagnostic delay is that of Case 4, in which the patient only received confirmation at 10 years of age. This likely occurred because there was associated intellectual disability and childhood obesity, which led some doctors to consider the hypothesis of Prader-Willi syndrome, delaying the correct diagnosis.

In the second year of life, children with ASD may exhibit repetitive behaviors both with their bodies and with objects, using them in unusual ways. For example, they may systematically line up toy cars instead of engaging in the versatile and creative use observed in neurotypical children. Additionally, it becomes evident that there is a lack of sharing objects and participation in group play, as well as few communicative behaviors, accompanied by a low level of eye contact. There is also a noticeable increase in irritability and a greater difficulty than usual in regulating negative emotions.[6]

As shown in Chart 2, we can observe that all five patients exhibited a typical profile of ASD in the first year of life, with progressive worsening of hyperactivity and aggression over the years. Patient C3, for example, displayed the stereotyped behavior of stacking objects. Meanwhile, patients C2 and C5 did not demonstrate good emotional control.

The São Paulo State Protocol for the Diagnosis, Treatment, and Referral of Patients with ASD recommends that re-evaluations be conducted every 6 (six) months in order to assess the gains achieved, points of stagnation, and new needs for individualized intervention reorientation. To facilitate this, the ATEC scale is suggested for use.[11,20] Thus, the assessment of the patients in this study can be seen in Table 1, which presents the ATEC scores of the patients before and after the introduction of *cannabis* oil in the medication therapy, as well as the CARS scores during the study period.

Table 1. ATEC before and after combined treatment, with its categories, and CARS of the evaluated patients, João Pessoa, Paraíba, Brazil, 2024.

	ATEC L	ATEC S	ATEC P	ATEC C	ATEC T	CARS-BR
Case 1	27|14	40|15	23|17	53|23	143|69	39
Case 2	15|8	17|3	27|8	45|11	104|30	30
Case 3	23|01	15|03	22|01	29|17	89|22	31
Case 4	22|13	33|29	16|14	47|33	118|89	47
Case 5	28|14	26|20	26|7	49|15	129|56	33

ATEC L: Language; ATEC S: Sociability; ATEC P: Sensorial/cognitive perception; ATEC C: Bahavior, Health, Physical aspects.

In this context, Paraíba does not have its own protocol; however, there are some available in the national territory, such as the Protocol for Access to *Cannabis*-Derived Products for the Treatment of Aggressive Behavior in Autism Spectrum Disorder within the Public Health Network of the State of Sergipe. This protocol focuses on establishing the flow for access for patients with ASD who exhibit refractory aggressive behavior, being a step ahead of many other Brazilian states in ensuring access to *cannabis* oil through the Unified Health System (SUS).[21]

This document is based on the Clinical Protocol and Therapeutic Guidelines for Aggressive Behavior in Autism Spectrum Disorder, produced by the Ministry of Health in 2022, and is the most current available at the national level. This document, in turn, is of national nature and should be adopted by the Health Departments of the States, the Federal District, and Municipalities in regulating access to care, authorization, registration, and reimbursement of the corresponding procedures, covering patients diagnosed with ASD and exhibiting severe aggressive behavior directed towards themselves or others, with low response or low adherence to non-medication interventions.[21,22]

Both protocols outline the expected treatment benefits. Improvements in functioning, social interaction, communication skills, and adaptive skills are anticipated, along with a reduction in the frequency and severity of behaviors that lead to aggression, as well as the promotion of academic functioning and cognitive

improvement. In this way, relations with family members and others in the social circle are improved, and adherence to non-medication therapies is also optimized, making them more effective.

As previously mentioned, ASD does not have a determined cause; therefore, the focus is on controlling the symptoms to promote a better quality of life for patients. In this context, among the most commonly used medications are risperidone and aripiprazole, which are atypical antipsychotics and are the only medications approved by the U.S. Food and Drug Administration (FDA) for symptoms related to ASD.[23]

In addition to these, the BSP also mentions olanzapine, quetiapine, ziprasidone, and clozapine, all of which are effective as second-generation antipsychotics. However, antipsychotics can cause significant side effects, such as weight gain, metabolic syndrome, hyperprolactinemia, extrapyramidal syndrome, decreased seizure threshold, and, very rarely, neuroleptic malignant syndrome. For this reason, it is recommended to treat children without the psychotropic drugs usage, except in cases of necessity, and they should be administered by specialists who are experienced in their precise indication.[6]

Due to the prohibitionist policy against *cannabis*, interest in its medicinal effects was only rekindled in the 1990s, through the description of cannabinoid receptors and the identification of an endogenous cannabinoid system in the brain. Cannabidiol (CBD) and ∆9-tetrahydrocannabinol (∆9-THC) are the most abundant active compounds in the plant, and they were only isolated and studied in greater depth after the 1960s, allowing for extensive research on their pharmacological properties. In addition to these, the plant contains dozens of other cannabinoids (chemical structures similar to CBD and THC) and other chemical compounds, such as terpenes and flavonoids, which also have therapeutic potential.[2,24,25]

These cannabinoids act by activating the endocannabinoid system through the CB1 and CB2 receptors. CBD has analgesic, anticonvulsant, anxiolytic, anti-inflammatory, antitumoral, and neuroprotective properties, making it applicable in various conditions, most commonly in chronic pain. Additionally, it is important to note that CBD also alters the levels of glutamate, glutamine, and GABA, substances that contribute to the regulation of excitatory and inhibitory neurotransmission in both neurotypical individuals and those with ASD.[26] In general, minimal adverse effects are reported, and even then, they often arise from the concurrent use of other medications.[2] The most common adverse effects, which typically occur at the beginning of treatment, are drowsiness, nausea, vomiting, diarrhea, and changes in appetite.[3]

The current sociopolitical scenario highlights the regulation of medicinal *cannabis* use, especially after 2015, when CBD was removed from the list of prohibited substances, allowing for its prescription and importation. In this context, the National Health Surveillance Agency (Anvisa) regulated the importation of *cannabis*-based products in 2015 and 2016, but the high costs made treatment inaccessible for many families. In light of this, *cannabis* associations have emerged in Paraíba, such as the *Cannabis* League of Paraíba and ABRACE, to facilitate access to these medications. In 2019, Anvisa published regulations that authorize the manufacture and importation of *cannabis* products. Thus, it is evident that the use of *cannabis* derivatives as medication is being increasingly studied and may become an increasingly important resource in Primary Health Care. The milestones and achievements for *cannabis* oil therapy in Brazil in recent years are listed in Chart 5[2,24,25,27-29].

In this context, some recent studies have shown that substances derived from *Cannabis sativa* are improving the quality of life of children with ASD, without causing severe adverse effects, making it a therapeutic alternative in cases where patients do not respond well to conventional therapy. However, more robust studies are still needed to demonstrate their actual efficacy.[1,3]

Table 5. Milestones and achievements for cannabis oil therapy in Brazil in recent years, João Pessoa, Paraíba, Brazil, 2024.

Year	Milestones or achievements for cannabis oil therapy in Brazil
2015	Removal of CBD from the list of prohibited substances and its inclusion in list C1 of Ordinance 344/98. ANVISA regulates the importation of cannabis-based products (RDC 17/2015).
2016	Authorization for the importation and medical use of THC and CBD by RDC 66/2016.
2019	ANVISA publishes RDC 327/2019, authorizing the manufacture and importation of cannabis-based products for medicinal purposes, as well as establishing requirements for the commercialization, prescription, dispensing, monitoring, and regulation of these products.
2023	Regulation by the Governor of São Paulo for the provision of cannabis-based medications through the SUS for the treatment of Dravet syndrome, Lennox-Gastaut syndrome, and tuberous sclerosis complex. Only in the states of Pernambuco, Paraíba, and Amapá is there no project presented.

Regarding ASD, much has been discussed about the advancements in the therapeutic use of *cannabis*. In the case of cannabidiol, recent studies indicate that CBD has a positive impact on social behavior and, therefore, emerges as a pharmacological alternative in the treatment of ASD.[24] Regarding the product choice, it is important to emphasize that full-spectrum formulations appear to be more effective compared to isolated *cannabis* components, due to the entourage effect (the synergistic interaction among the various compounds present in the plant, particularly THC and CBD). However, there are currently no full-spectrum products approved by the FDA for pediatric use. Thus, the management of cannabinoids in the pediatric age group must be conducted with caution, given the THC potential deleterious effects on the developing brain.[3]

It was with this in mind that the prescription for the cases reported in this study involved the full-spectrum *cannabis* oil rich in CBD (20 mg/ml). Given that it is a pediatric population, extra caution was taken regarding the concentration of THC, opting for the oil with a 20:1 ratio of CBD to THC, with at least one hour spacing between other medications to reduce potential drug interactions. Additionally, the prescription involved a weekly progression in the number of drops, starting with three sublingual drops three times a day after meals, increasing by one drop per week until finding a dose that effectively controlled the primary symptoms of each patient without the potential side effects. The maintenance doses for the studied patients, for example, remained around 1 mg/kg/day of CBD.[30]

In the past two decades, parents of children with ASD have been autonomously treating their children with medicinal *cannabis* and reporting therapeutic success, despite the lack of clinical guidelines on the subject. Following the *cannabis* legalization for medicinal use in many Western countries, several open studies have reported that children with ASD show good responses to treatment with CBD-rich *cannabis* and that this treatment is safe and effective. In studies that used questionnaires for parents, there were reports of improvement in social communication, along with reductions in disruptive behaviors, including self-harm, temper outbursts, restlessness, and agitation. This corroborates the findings of this case series, as the reports from the patients' mothers involve the same aspects of improvement.[31]

According to Silva Junior,[1] the results found in their randomized, double-blind, placebo-controlled clinical trial involving 60 children aged 5 to 11 demonstrate that CBD-rich *cannabis* oil is effective and can be used as a therapeutic adjunct. The literature also reports on its efficacy regarding agitation, concentration, and social interaction, improving hyperactivity, restlessness, psychomotor agitation, anxiety, cognition, and attention. This brings optimistic perspectives for the children's future on the autism spectrum, directly impacting their quality of life.

Additionally, in an Israeli study, 188 children with an average age of 13 years were evaluated, with a follow-up period of six months. In this study, a *cannabis* oil product with a ratio of 20 CBD to 1 THC was used, and it was observed that there was an 80% overall improvement in the patients' quality of life, with few side effects, the most common being drowsiness.[32]

It is also worth reiterating another double-blind, placebo-controlled study that tested the CBD-rich *cannabis* efficacy in the treatment of ASD. The study included 150 children and adolescents with ASD, aged 5 to 21 years, over a period of three months. The study revealed safety and efficacy in improving the ASD main symptoms, as reported by parents through questionnaires and based on the clinical patients assessment using the Clinical Global Impression scale.[33]

Similarly, an open study conducted to examine 82 children and adolescents with ASD aimed to evaluate the treatment efficacy with CBD-rich *cannabis*, for six months, using standardized clinical assessments (Autism Diagnostic Observation Schedule – ADOS), parent interviews (Vineland Adaptive Behavior Scales), and questionnaires (Social Responsiveness Scale – SRS). It was concluded that CBD-rich *cannabis* may bring benefits to some individuals with ASD, including improvements in social communication skills, particularly for participants with high initial severity of the main ASD symptoms.[31]

Thus, the present study evaluated the therapeutic response to the use of full-spectrum CBD-rich *cannabis* oil (20 mg/ml) as an adjunct for pediatric patients aged 5 to 11 years. It was observed that the patients exhibited good tolerability, with no significant side effects or adverse reactions. At the time of the research, the patients had been using the oil for between 4 and 10 months (an average of 7.4 months) in conjunction with treatment, showing improvements in symptoms such as hyperactivity, insomnia, irritability, self-injurious behavior, and aggression towards others, as well as improvements in communication, social interaction, concentration, and food selectivity, as anticipated by the current protocols.[21,22]

It is important to emphasize that the present study does not propose the indiscriminate *cannabis* oil usage for pediatric patients with ASD. All reported cases used the oil as a complementary treatment alongside the therapy already in place, aiming to optimize the patients' clinical control and reduce some significant side effects of administered medications, thereby offering an improved quality of life for both the patients and their families.

CONFLICT OF INTEREST

Nothing to declare.

AUTHORS' CONTRIBUTIONS

ABMP: Concept, Data curatorship, Formal analysis, Investigation, Methodology, Project Administration, Visualization, Writing – first draft, Writing – review and editing. IBCMA: Concept, Data curatorship, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – review and editing. Validation. LAPL: Concept, Data curatorship, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – first draft, Writing – review and editing. KLGDA: Concept, Data curatorship, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – review and editing.

REFERENCES

1. Silva EAD Junior, Medeiros WMB, Santos JPMD, Sousa JMM, Costa FBD, Pontes KM, et al. Evaluation of the efficacy and safety of cannabidiol-rich cannabis extract in children with autism spectrum disorder: randomized, double-blind, and placebo-controlled clinical trial. Trends Psychiatry Psychother. 2024;46:e20210396. https://doi.org/10.47626/2237-6089-2021-0396
2. Pina G, Figueiredo AVSMV, Santos AF, Coppolla MB, Silva IM, Passos PVF, et al. Transtorno do espectro autista infantil, Cannabis medicinal e fatores relevantes: revisão de literatura. Braz J Health Rev. 2023;6(5):25786-800. https://doi.org/10.34119/bjhrv6n5-565
3. Mimura PMP, Ferreira LS, Pereira CL. Cannabinoids for the treatment of autism and childhood epilepsy. BrJP. 2023;6(Supl. 2):139-41. https://doi.org/10.5935/2595-0118.20230022-en
4. Montenegro MA, Celeri EHR, Casella EB. Transtorno do espectro autista-TEA: manual prático de diagnóstico e tratamento. Rio de Janeiro: Thieme Revinter; 2018.
5. Costa KCM. Avaliação dos efeitos do canabidiol sobre as consequências comportamentais induzidas pelo tratamento com o ácido valproico durante o período embrionário do zebrafish [thesis]. Ribeirão Preto: Faculdade de Medicina de Ribeirão Preto; 2023.
6. Sociedade Brasileira de Pediatria. Departamento Científico de Pediatria do Desenvolvimento e Comportamento. Transtorno do Espectro do Autismo [Internet]. Brasil: Sociedade Brasileira de Pediatria; 2019 [accessed on Nov. 19, 2025]. Available at: https://www.sbp.com.br/fileadmin/user_upload/Ped._Desenvolvimento_-_21775b-MO_-_Transtorno_do_Espectro_do_Autismo.pdf
7. Centers for Disease Control and Prevention. Autism and developmental disabilities monitoring (ADDM) network [Internet]. Centers for Disease Control and Prevention; 2023 [accessed on Nov. 19, 2025]. Available at: https://www.cdc.gov/ncbddd/autism/pdf/ADDM-Community-Report-SY2020-h.pdf
8. Oliveira C. Um retrato do autismo no Brasil. Revista Espaço Aberto [Internet]. 2015 [accessed on Nov. 19, 2025]. Available at: https://biton.uspnet.usp.br/espaber/?materia=um-retrato-do-autismo-no-brasil
9. Prefeitura de João Pessoa. Centro de Referência Municipal para Inclusão da Pessoa com Deficiência [Internet]. João Pessoa: Prefeitura de João Pessoa; 2021 [accessed on Nov. 19, 2025]. Available at: https://www.joaopessoa.pb.gov.br/servico/centro-de-referencia-municipal-para-inclusao-da-pessoa-com-deficiencia/
10. Governo da Paraíba. A FUNAD. Fundação Centro Integrado de Apoio ao Portador de Deficiência (Funad) [Internet]. Paraíba: Governo da Paraíba [accessed on Nov. 19, 2025]. Available at: https://funad.pb.gov.br/a-funad
11. Rimland B, Edelson S. Autism Treat Eval Checklist (ATEC). San Diego: Autism Research Institute; 1999.
12. Schopler E, Reichler RJ, Renner BR. CARS: The childhood autism rating scale. Los Angeles: Western Psychological Services; 1988.
13. Duarte R. Entrevistas em pesquisas qualitativas. Educ Rev. 2004;20(24):213-25.
14. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Especializada e Temática. Linha de cuidado para a atenção às pessoas com transtornos do espectro do autismo e suas famílias na Rede de Atenção Psicossocial do Sistema Único de Saúde. Brasília: Ministério da Saúde; 2015.
15. Dawson G. Early behavioral intervention, brain plasticity, and the prevention of autism spectrum disorder. Dev Psychopathol. 2008;20(3):775-803. https://doi.org/10.1017/s0954579408000370
16. Centers for Disease Control and Prevention. Data and Statistics on Autism Spectrum Disorder [Internet]. Centers for Disease Control and Prevention; 2024 [accessed on Nov. 19, 2025]. Available at: https://www.cdc.gov/autism/data-research/index.html
17. Randall M, Egberts KJ, Samtani A, Scholten RJ, Hooft L, Livingstone N, et al. Diagnostic tests for autism spectrum disorder (ASD) in preschool children. Cochrane Database Syst Rev. 2018;7(7):CD009044. https://doi.org/10.1002/14651858.cd009044.pub2
18. Lemay J-F, Yohemas M, Langenberger S. Redesign of the autism spectrum screening and diagnostic process for children aged 12 to 36 months. Paediatr Child Health. 2018;23(5):308-13. https://doi.org/10.1093/pch/pxx187
19. Ribeiro SH, Paula CS de, Bordini D, Mari JJ, Caetano SC. Barriers to early identification of autism in Brazil. Rev Bras Psiquiatr. 2017;39(4):352-4. https://doi.org/10.1590/1516-4446-2016-2141
20. Secretaria da Saúde do Estado de São Paulo. Grupo Técnico em TEA constituído pela Resolução SS-17 de 2013. Protocolo do Estado de São Paulo de Diagnóstico Tratamento e Encaminhamento de Pacientes com Transtorno do Espectro Autista (TEA) [Internet]. São Paulo: Secretaria da Saúde do Estado de São Paulo; 2013 [accessed on Nov. 19, 2025]. Available at: https://www.saude.sp.gov.br/ses/perfil/profissional-da-saude/homepage/destaques/protocolo-do-estado-de-sao-paulo-de-diagnostico-tratamento-e-encaminhamento-de-pacientes-com-transtorno-do-espectro-autista-tea
21. Conceição BM. Protocolo de acesso aos produtos derivados de cannabis spp. para tratamento do comportamento agressivo no transtorno do espectro do autismo na rede pública de saúde do estado de Sergipe [Internet]. Sergipe: Secretaria de Estado da Saúde; 2024 [accessed on Nov. 19, 2025]. Available at: https://saude.se.gov.br/wp-content/uploads/2024/08/Protocolos-Cannabis-SPP-Autismo.pdf
22. Comissão Nacional de Incorporação de Tecnologias no Sistema Único de Saúde. PCDT - Comportamento agressivo no transtorno do espectro do autismo [Internet]. Ministério da Saúde; 2022 [accessed on Nov. 19, 2025]. Available at: https://www.gov.br/conitec/pt-br/midias/protocolos/20220419_portal-portaria_conjunta_7_comportamento_agressivo_tea.pdf/view
23. Anagnostou E, Zwaigenbaum L, Szatmari P, Fombonne E, Fernandez BA, Woodbury Smith M, et al. Autism spectrum disorder: advances in evidence-based practice. CMAJ. 2014;186(7):509-19. https://doi.org/10.1503/cmaj.121756

24. Zuardi AW. History of cannabis as a medicine: a review. Braz J Psychiatry. 2006;28(2):153-7. https://doi.org/10.1590/s1516-44462006000200015
25. Andrade KKPM, Carvalho MEB. Percepção dos responsáveis por crianças autistas sobre o uso de canabinóides no tratamento de sintomas desencadeados pelo espectro autista [final project]. Recife: Faculdade Pernambucana de Saúde; 2019.
26. Silva Junior EAD, Medeiros WMB, Torro N, Sousa JMM, Almeida IBCM, Costa FBD, et al. Cannabis and cannabinoid use in autism spectrum disorder: a systematic review. Trends Psychiatry Psychother. 2022;44:e20200149. https://doi.org/10.47626/2237-6089-2020-0149
27. Agência Nacional de Vigilância Sanitária. Resolução RDC nº 17 de 6 de maio de 2015. Define os critérios e os procedimentos para a importação, em caráter de excepcionalidade, de produto à base de Canabidiol em associação com outros canabinóides, por pessoa física, para uso próprio, mediante prescrição de profissional legalmente habilitado, para tratamento de saúde. Diário Oficial da União. 2015;Seção 1(86):44-56.
28. Oliveira A. Relembre marcos dos 10 anos de cannabis medicinal no Brasil. CNN Brasil [Internet]. 2024 [acessed on Nov. 19, 2025]. Available at: https://www.cnnbrasil.com.br/saude/relembre-marcos-dos-10-anos-de-cannabis-medicinal-no-brasil/
29. Tribunal de Justiça da Paraíba. Poder Judiciário. Câmara Criminal concede HC a associados da Acaflor para cultivo e uso de produtos da cannabis [Internet]. 2024 [acessed on Nov. 19, 2025]. Available at: https://www.tjpb.jus.br/noticia/camara-criminal-concede-hc-a-associados-da-acaflor-para-cultivo-e-uso-de-produtos-da
30. Barroso VV, Mello Neto P da C, Zimmer Junior CJ. Cannabis medicinal: guia de prescrição. Santana de Parnaíba: Manole; 2023.
31. Hacohen M, Stolar OE, Berkovitch M, Elkana O, Kohn E, Hazan A, et al. Children and adolescents with ASD treated with CBD-rich cannabis exhibit significant improvements particularly in social symptoms: an open label study. Transl Psychiatry. 2022;12(1):375. https://doi.org/10.1038/s41398-022-02104-8
32. Bar-Lev Schleider L, Mechoulam R, Saban N, Meiri G, Novack V. Real life experience of medical cannabis treatment in autism: analysis of safety and efficacy. Sci Rep. 2019;9(1):200. https://doi.org/10.1038/s41598-018-37570-y
33. Aran A, Harel M, Cassuto H, Polyansky L, Schnapp A, Wattad N, et al. Tratamento com canabinóides para autismo: um ensaio randomizado de prova de conceito. Mol Autismo. 2021;12(1):6. https://doi.org/10.1186/s13229-021-00420-2