

Autism Spectrum Disorder

Autism spectrum disorder (ASD) refers to a group of neurodevelopmental disorders, the symptoms of which include impaired communication and social interaction with restricted or repetitive motor movements. In some instances, it may also be associated with general cognitive deficits. Although ASD can be diagnosed at any age, it is defined as a “developmental disorder” because symptoms typically manifest within the first two years of life. Autism is known as a spectrum disorder because its symptoms can range from mild to debilitating.

Modulation of the endocannabinoid system has been suggested as a target for ASD therapies,¹ and children with ASD have been found to possess lower-than-normal levels of certain endogenous cannabinoids, including anandamide.²

In recent years, a growing number of human studies and case reports have documented improvements in ASD patients following the administration of various cannabinoid formulations.³

For instance, a 2019 Brazilian observational trial reported that the twice-daily administration of plant-derived CBD extracts was associated with improved ASD symptoms in 14 out of 15 adolescent subjects.⁴

A series of Israeli trials have also documented favorable results. In 2018, researchers reported to the journal *Neurology* that the administration of CBD-dominant cannabis extracts led to significant improvements in over 60 percent of ASD patients with refractory behavioral problems.⁵

A 2019 study involving 188 patients reported that over 90 percent of subjects who were administered CBD-dominant extracts for a period of at least six months demonstrated “some level of symptomatic improvement.” Approximately one-third of respondents reported a reduction in their intake of other medications. Authors concluded, “Cannabis as a treatment for autism spectrum disorders patients appears to be well-tolerated, safe, and [an] effective option to relieve symptoms, mainly: seizures, tics, depression, restlessness, and rage attacks.”⁶

Yet another Israeli trial completed that same year similarly reported that the use of CBD extracts resulted in “overall improvements” in a cohort of 53 children with ASD.⁷

In 2020, US researchers affiliated with Tufts University in Boston reported on their clinical experience working with children and young adults with ASD who had consumed either cannabis or hemp-based products. Among subjects with ASD-associated aggression, 60 percent reported improvements following treatment. Among subjects diagnosed with both ASD and epilepsy, 91 percent reported some improvement in seizure control.⁸

The following year, Canadian researchers documented the successful treatment of a 15-year-old patient with autism after adding low doses of CBD/THC extracts adjunctively. Researchers reported that the patient’s symptoms improved within six months of treatment, and that he had experienced “positive effects on his behavioral symptoms, anxiety, sleep, and social deficits” since that time.⁹

Most recently, a placebo-controlled clinical trial reported that the administration of whole-plant cannabis extracts were safe and effective in a cohort of 150 adolescents with autism. Researchers reported: “In this study, we have demonstrated for the first time in a placebo-controlled trial that cannabinoid

treatment has the potential to decrease disruptive behaviors associated with ASD, with acceptable tolerability. ... Disruptive behavior on the CGI-I [Clinical Global Impression-Improvement scale] was either much or very much improved in 49 percent [of subjects taking] whole-plant extract versus 21 percent on placebo. Median SRS [Social Responsiveness Scale] Total Score (secondary-outcome) improved by 14.9 [points] on whole-plant extract versus 3.6 points after placebo.”¹⁰

A 2021 review of the relevant literature summarized: “Cannabis products [have been demonstrated to] reduce the number and/or intensity of different symptoms, including hyperactivity, attacks of self-mutilation and anger, sleep problems, anxiety, restlessness, psychomotor agitation, irritability, aggressiveness perseverance, and depression. Moreover, they [are associated with an] improvement in cognition, sensory sensitivity, attention, social interaction, and language.” Authors concluded, “Cannabis and cannabinoids may have promising effects in the treatment of symptoms related to ASD, and can be used as a therapeutic alternative in the relief of those symptoms.”¹¹

REFERENCES

- ¹ Zamberletti et al. 2017. [The endocannabinoid system and autism spectrum disorders: Insights from animal models](#). *International Journal of Molecular Sciences* 18: 1916 [open access journal].
- ² Aran et al. 2019. [Lower circulating endocannabinoid levels in children with autism spectrum disorder](#). *Molecular Autism* 10 [open access journal].
- ³ da Silva et al. 2021. [Cannabis and cannabinoid use in autism spectrum disorder: A systematic review](#). *Trends in Psychiatry and Psychotherapy* [open access journal].
- ⁴ Fleury-Teixeira et al. 2019. [Effects of CBD-enriched cannabis sativa extract on autism spectrum disorder symptoms: An observational study of 18 participants undergoing compassionate use](#). *Frontiers in Neurology* 10 [open access journal].
- ⁵ Aran et al. 2018. [Cannabidiol-based medical cannabis in children with autism: A retrospective feasibility study](#). *Neurology* 90.
- ⁶ Bar-Lev Schleider et al. 2019. [Real life experiences of medical cannabis treatment in autism: Analysis of safety and efficacy](#). *Scientific Reports* 9: 200.
- ⁷ Barchel et al. 2019. [Oral cannabidiol use in children in with autism spectrum disorder to treat related symptoms and co-morbidities](#). *Frontiers in Pharmacology* 9: 1521.
- ⁸ Mostafavi and Gaitanis. 2020. [Autism spectrum disorder and medical cannabis: Review and clinical experience](#). *Seminars in Pediatric Neurology* 35 [online publication].
- ⁹ Andrea-Ponton et al. 2021. [A pediatric patient with autism spectrum disorder and epilepsy using cannabinoid extract as complementary therapy: A case report](#). *Journal of Medical Case Reports* [open access journal].
- ¹⁰ Aran et al. 2021. [Cannabinoid treatment for autism: A proof-of-concept randomized trials](#). *Molecular Autism* 12 [open access journal].
- ¹¹ da Silva et al. 2021. Op. cit.