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Perspectives in Pediatric Neurology

Cannabinoids in the Treatment of Autism Spectrum Disorder: Demanding Data Before Using Fad Therapies

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Despite medical advances in autism research, this complex neurodevelopmental condition remains a medical mystery. According to a new report from the US Centers for Disease Control and Prevention (CDC) autism spectrum disorder (ASD) has increased by 15% from 2012 to 2014 and 150% increase since 2000. The rise in prevalence has been attributed to improved awareness of ASD and to changes to the Diagnostic and Statistical Manual of Mental Disorders (DSM V). The core characteristics of ASD are challenges with social interaction, communication, overstimulation, and restricted behavioral repertoire. Autism imposes an immeasurable physical, financial, and emotional burden upon family dynamics.¹

Families of children with ASD experience significant stress and poorer parental quality of life.² The research suggests that mothers with adolescents and adults with ASD experience chronic stress similar to military personnel in combat.² This is because those with ASD often engage in behaviors such as tantrums, physical aggression, and self-injury, often leading to parental burnout. Pharmacologic management of patients with ASD varies, and only two antipsychotics drugs, aripiprazole and risperidone, have received Food and Drug Administration approval to treat challenging behaviors in those with ASD. However, these drugs are not always effective in

improving irritability and can have severe and sometimes irreversible side effects.

Unlike behavioral therapies (i.e., applied behavioral analysis), pharmacologic treatment does not improve the core characteristics of ASD, and the irritable behaviors often return when the drugs are discontinued. It should be noted that there is an emergence of pharmacologic agents that may improve irritability and aggression in a subset of patients with ASD by targeting components of the glutamatergic system.³ While early results of these drugs seem promising, additional studies are needed to show efficacy.

In the absence of good therapeutic treatment options, desperate parents are increasingly turning to scientifically unsupported therapies such as gluten-free and/or casein-free diets, Leuprolide therapy, transcranial magnetic stimulation, dietary supplements, chelation, bleach, and stem cell therapies to improve irritability and problematic behaviors in those with ASD. As a parent of a nonverbal, severely autistic child, I understand why these controversial therapies are advocated among those caring for individuals with ASD, but the associated cost (time, effort, and resources) does not justify the means. In addition, these fad treatments can be potentially harmful to an individual with ASD.

Due to the sudden re-emergence of cannabinoids and the serendipitous discovery of the endocannabinoid system (ECS), some in the autism community such as Mothers Advocating for Medical Marijuana for Autism (MAMMA) have called for the expanded legalization of medical marijuana with the listing of autism as a qualifying condition. Currently, 30 states have legalized

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marijuana for medicinal use. However, in a 2015 policy statement and technical report, the American Academy of Pediatrics (AAP) reiterated its opposition to the legalization of marijuana, but acknowledged the use of marijuana for “compassionate use” for children with debilitating or life-limiting illnesses. In addition, the AAP encourages pediatricians to counsel patients about the consequences of marijuana or cannabis use. To date, evidence about the efficacy and safety of oral cannabis preparations are mostly based on surveys and case reports.⁴ Medicinal cannabis has been used in a variety of conditions, such as drug refractory epilepsy, multiple sclerosis, chemotherapy-related nausea, and Parkinson disease. However, a synopsis of the literature demonstrates that the scientific evidence on efficacy of medicinal cannabis is mixed. While there is some evidence to suggest that cannabinoids may be neuroprotective and possess anti-inflammatory effects, there is no empirical evidence that it is neuroregenerative or helps to ameliorate irritable behaviors in autistic children.⁵ But that may be changing given the number of clinical trials now underway in California, New York, Philadelphia, Chile, and Israel, which has extensively studied medicinal cannabis for the treatment of a variety of conditions and ailments. In fact, Israel has the largest number of randomized control trials on the subject of medicinal cannabis.⁶

It has been estimated that marijuana contains over 400 natural compounds, and the two main active cannabinoids being researched are tetrahydrocannabinol (THC) primarily used for recreational purposes and cannabidiol (CBD).⁷ THC is considered psychotropic whereas CBD is not.⁵ There is a plethora of CBD products on the market, but only oral CBD has been approved for medicinal purposes in two rare severe forms of epilepsy. The CBD market remains largely unregulated and CBD products that contain less than 0.3% THC are classified as hemp-derived products under federal law.⁵

The mechanism of cannabinoid action in the developing brain of those with and without ASD remains poorly understood. In addition, those using CBD may be at risk of inhibition of hepatic drug metabolism, dry mouth, light-headedness, euphoria, neurological adverse effects, and low blood pressure, among other side effects. Moreover,

hemp may contain worrisome levels of toxins from pesticide byproducts. Amid these concerns, more research is needed to fill critical evidence gaps concerning additional short- and long-term physiological effects and risks of medicinal cannabis strains, cannabis-related drug interactions, dosing regimens, routes of administration, the legality, and ethicality of prescribing CBD products for those with ASD and other intellectual disabilities.⁸

The debate concerning the utility and effectiveness of CBD in suppressing irritability and problematic behaviors in people with ASD can only be settled by data from high-quality randomized controlled studies with well-articulated methods. Until then, cannabinoids such as CBD joins the very long list of unsubstantiated autism treatment fads that appear devoid of strong empirical evidence. As a member of the healthcare profession, we all have a duty to caution parents and caregivers about the potential risks and unintended consequences associated with medical fads.

References

1. Buescher AVS, Cidav Z, Knapp M, Mandell DS. Costs of autism spectrum disorders in the United Kingdom and the United States. *JAMA Pediatr.* 2014;168:721–728. <https://doi.org/10.1001/jama-pediatrics.2014.210>.
2. Seltzer MM, Greenberg JS, Hong J, et al. Maternal cortisol levels and behavior problems in adolescents and adults with ASD. *J Autism Dev Disord.* 2010;40:457–469. <https://doi.org/10.1007/s10803-009-0887-0>.
3. Fung LK, Hardan AY. Developing medications targeting glutamatergic dysfunction in autism: progress to date. *CNS Drugs.* 2015;29:453–463. <https://doi.org/10.1007/s40263-015-0252-0>.
4. Perucca E. Cannabinoids in the treatment of epilepsy: hard evidence at last? *J Epilepsy Res.* 2017;7:61–76. <https://doi.org/10.14581/jer.17012>.
5. Baron EP. Comprehensive review of medicinal marijuana, cannabinoids, and therapeutic implications in medicine and headache: what a long strange trip it's been. *Headache.* 2015;55:885–916.
6. Siegel-Itzkovich J. Israel medical cannabis is flying high Health and Science section *Jerusalem Post.* 2017. Available at: <https://www.jpost.com/HEALTH-SCIENCE/Israeli-medical-cannabis-is-flying-high-502905>. Accessed August 20, 2018.
7. ElSohly MA, Slade D. Chemical constituents of marijuana: the complex mixture of natural cannabinoids. *Life Sci.* 2005;78:539–548.
8. MacCallum CA, Russo EB. Practical considerations in medical cannabis administration and dosing. *Eur J Intern Med.* 2018;49:12–19.