# The use of CBD for Autism Spectrum Disorder and behaviors like SIB

## You're not Alone!

Interest in the use of cannabis and one of its main components, cannabidiol (CBD), has grown over the past few years for a range of issues, including comorbidities of autism spectrum disorder (ASD) like aggression and self-injurious behaviour. Gaining a basic understanding of the endocannabinoid system and reviewing the results of three recent studies of CBD-rich cannabis for autism spectrum disorder could be helpful when considering the use of CBD for Children with Neurodevelopmental Differences (NDDs).



The Endocannabinoid System (ECS) is a system in our body made of lipid (fats) molecules, their receptors, and various enzymes. **The ECS is involved in many critical body functions** such as learning and memory, emotional processing, sleep, temperature control, pain control, inflammatory and immune responses, and eating.

The ECS comprises **two types of receptors: CB1 and CB2**. CB1 receptors are found throughout the central and peripheral nervous system and CB2 receptors are found mostly in the immune system. CB1 receptors are thought to be involved in the feeling of pleasure, memory, thought, concentration and movement. CB2 receptors are associated with the lymphatic and immune systems.

CBD is extracted from the cannabis plant and it's available commercially in many forms, from oils to chewable gummies. It has become popular as a treatment for multiple conditions.



ABO

### THE CULTURAL CONTEXT OF MEDICAL CBD USE IN CHILDREN

In just a few years, **CBD has become immensely popular**. After initially being discovered as an effective treatment for Dravet syndrome in children, CBD is now sold and used for a wide range of medical conditions and diseases. Part of the popularity of CBD can be attributed to the story of Charlotte Figi.

**Charlotte Figi** (October 18, 2006 – April 7, 2020) was an American girl with Dravet syndrome, a rare and potentially life-threatening genetic condition that causes unrelenting epilepsy.



Charlotte's parents tried numerous medications to quell Charlotte's seizures, but none worked. Finally, she started taking an oil from a strain of cannabis with low THC and high CBD, and quickly there was a **major decrease in the frequency of her seizures**. The story of Charlotte spread throughout the community of parents of children with epilepsy and due to it's success there, parents wondered if CBD would help other symptoms.

Since Charlotte's story broke much **more research,** including large-scale randomized control trials have been conducted on CBD use in childhood epilepsy. In 2018, enough evidence for CBD's use to treat epilepsy culminated in the **FDA approval of Epidiolex**, which is CBD in pharmaceutical form for Lennox-Gastaut and Dravet syndromes..

CB1 receptors are primarily found CB2 receptors are mostly in the CB<sub>2</sub> **CB1** in the brain and central nervous peripheral organs. Especially cells associated with the immune system, and to a lesser extent in other tissues system. Brain/CNS/Spinal cord CB1 Eye Lymphatic and immune system Thyroid CB1 Tonsil Lymphocytes Upper airways CB Thymus Spleen Blood Liver **CB1** Heart Adrenals **CB1** Skin Gastrointestinal track Ovaries **CB1** Uterus CB1 CB1 CB2 Prostate CB1 Bone Testes **CB1** Non-immune system Skin (keratinocytes)

# **3** | PHYTOCANNABINOIDS AND THE DIFFERENCES BETWEEN THC AND CBD

The two main cannabis species are *Cannabis indica* and *Cannabis sativa*. Both cannabis species produce a vast number of different molecules, including a large number of Phytocannabinoids. **Phyto-cannabinoids are cannabinoids produced** by plants and are molecules that are similar to our own endocannabinoids. Different strains of cannabis will have different amounts and ratios of these cannabinoids.

The two main phytocannabinoids which are present in the largest quantities in the cannabis plant are  $\Delta$ 9-tetrahydrocannabinol (THC) and Cannabidiol (CBD).



# RECENT STUDIES OF CBD-RICH CANNABIS FOR ASD AND BEHAVIOURS LIKE SIB



Causes the "high" of cannabis use.

Current medical uses:

- Chronic pain
- MS spasticity
- chemo-related

nausea



Although cannabis, particularly CBD, has been researched fairly extensively in pediatric epilepsy syndromes, there has been less attention paid to using cannabinoids for treating symptoms and comorbidities of ASD. However, this is changing with the majority of the research occurring in the past few years.



#### STUDY

Oral Cannabidiol Use in Children With Autism Spectrum Disorder to Treat Related Symptoms and Co-morbidities

**STUDY** 

**Cannabinoid Treatment for Autism:** 

a Proof-of-Concept Randomized Trial

Barchel et al. 2019

Aran et al. 2019

Method

53 kids recruited with ASD and administered cannabis extract at a ratio of 20:1 CBD to THC, followed-up for at least 30 days

DOMAIN	% of participants improved	% of participants unchange	% of participants worsen
Hyperactivity	68.4%	28.9%	2.6%
SIB/rage attacks	67.6%	23.5%	8.8%
Sleep problems	<b>47.</b> 1%	29.4%	23.5%
Anxiety	<b>47.</b> 1%	29.4%	23.5%

#### Method

150 children, average age 11.8 years, were recruited and randomly assigned to one of the three groups

#### 3 GROUPS

Placebo - 50 participants Pure Cannabinoids - 50 participants Whole plant extact - 50 participants

#### Results

21% of participants reported having a positive response in the placebo group, 49% of participants reported having a positive response in the whole plant group, and 38% of participants reported having a positive response in the pure cannabinoids group.

\*Note: Every **child is unique and can react differently to treatment and medications.** Ask your physician to discuss doses, potential side effects as well as drug interactions and potential withdrawal symptoms associated with CBD and other cannabis products.



