

ATTENTION DEFICIT/ HYPERACTIVITY DISORDER



Attention Deficit/Hyperactivity Disorder (ADHD) is generally a lifelong processing disorder. ADHD is characterized by unusual levels of impulsivity, inattention, and hyperactivity that produce impairment of social and behavioral functioning. The disorder generally presents itself in childhood with more prevalent hyperactivity symptoms, then progresses more towards deficits in concentration in adulthood. ADHD is found to be familial.

“The concept of impulsivity is difficult to define as it covers a wide range of “actions that are poorly conceived, prematurely expressed, unduly risky or inappropriate to the situation and that often result in undesirable outcomes” (Daruna and Barnes, 1993)”

The primary cause of ADHD is not fully understood, but evidence suggests that a dysfunction in the dopamine reward pathway in adult ADHD patients may contribute to inattention symptoms.

The intake of amphetamine type stimulants, including methylphenidate (Ritalin), leads to a release of dopamine into the synapse. Methylphenidate is recognized as a first line option in the clinical treatment of adults with ADHD. Amphetamine stimulants do present a significant abuse potential.

Substance abuse disorder (SUD) is a very common comorbidity with ADHD, and it is believed that SUD is driven by the desire for self-medication. It has also been found that moderate cannabis use in adult ADHD patients leads to a significant reduction in dependence on more harmful substances like alcohol, cocaine, and opioids.

THC mediates dopamine levels in different areas of the brain, increasing it in the neocortex but reducing it in the amygdala. This can mirror the action of commercial amphetamine treatments.

Impulsivity is a phenomenon controlled in part by cortical Glutamate and GABA specific neurons. Glutamate neurons control excitatory processes and when activated will result in generally more impulsive behavior. GABA controlled neurons modulate inhibitory processes and when activated increases the likelihood of cautious behavior. CB1 activation inhibits both glutamate and GABA neurons at the same time. However, glutamate neurons are more sensitive to CB1 activation than GABA neurons, so the end result is a balance towards less impulsive behavior.

Cannabis has been studied in the clinic for treatment of ADHD symptoms. Clinical results show cannabis affects a nominal improvement in both hyperactivity and impulsivity and is generally well tolerated, although more clinical study is needed to draw significant conclusions.

TERPENES

β -Caryophyllene (BCP) is known to interact with the dopaminergic system and parallels THC's effects.

α -Pinene is known to interact with the GABA system and would be beneficial to search out for this symptom.

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