

CA-ADAP Review: N-Acetylcysteine for Cannabis Use Disorder

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Substance Use Disorder (SUD)

**SUD is complex,
where there is
uncontrolled use
despite harmful
consequences**

- ▶ People with SUD have an intense focus (addiction) on using a certain substance(s) to the point where the ability to function in daily life is impacted
- ▶ Repeated substance use can cause brain-function changes

Cannabis Use Disorder (CUD)

**The inability to
stop using
cannabis even
when it causes
harm**

- ▶ Risk of cannabis use disorder (CUD) is estimated to affect ~10% of users
- ▶ No approved pharmacological treatment
- ▶ Treatment often complicated by comorbid conditions
- ▶ N-Acetylcysteine (NAC) has shown promising results

**NAC may
reverse neural
dysfunction seen
in CUD**

- ▶ By the time most people seek treatment, years of chronic substance use have likely led to significant brain-related adaptations
- ▶ With repeated substance use, a stronger urge to use the drug develops, driven more by compulsion
- ▶ Numerous neural adaptations underlie the transition from “liking” to compulsive use

Clinical Trials with NAC for the Treatment of CUD

Study	Sample	Dosing	Outcomes
Gray et al (2010)	N = 24 adolescents/emerging adults (age 18 to 21) with cannabis dependence (75% male, 92% white)	1,200 mg twice daily (2,400 mg/d) for 4 weeks (open-label)	<ul style="list-style-type: none"> •Reduction in self-reported number of cannabis use days and number of “hits” per day •Reduction in self-reported craving •Non-significant reduction in semi-quantitative creatinine- normalized cannabinoid levels
Gray et al (2012); Roten et al (2013)	N = 116 adolescents (ages 15 to 21) with cannabis dependence (72% male, 84% white)	1,200 mg twice daily (2,400 mg/d) vs placebo for 8 weeks (double-blind) added to contingency management	<ul style="list-style-type: none"> •Double the odds of abstinence in NAC group relative to placebo (as confirmed via urine cannabinoid test) at end of treatment •No group differences in self- reported number of cannabis use days or craving
Gray et al (2017)	N = 302 adults with cannabis use disorder (77% male, 55% white, 29% black/African American)	1,200 mg twice daily (2,400 mg/d) vs placebo for 12 weeks (double-blind) added to contingency management	<ul style="list-style-type: none"> •No group differences in odds of abstinence •No group differences in self- reported number of cannabis use days •Numerical, non-significant trend for double odds of abstinence among younger age group receiving NAC vs placebo (age 18 to 21)

**NAC may be
efficacious for CUD**

- ▶ Combined with contingency management, NAC may be efficacious for adolescents with cannabis use disorder, with treatment gains evident by the 4th week of treatment

Other Uses for N-Acetylcysteine

For the treatment of acetaminophen overdose to prevent or lessen hepatic injury after ingestion of a potentially hepatotoxic quantity of acetaminophen



Can be given as IV infusion, oral solution, or oral nebulizer solution

For adjunctive treatment of chronic obstructive pulmonary disease (COPD) as well as tuberculosis, bronchiectasis, and primary amyloidosis of the lung



Given as nebulization (via face mask, mouth piece, or tracheostomy), or by intratracheal instillation

For mucolysis of viscous or inspissated mucous secretions in patients with pulmonary conditions and for use during tracheostomy care, anesthesia, and diagnostic bronchograms



Given as nebulization (via face mask, mouth piece, or tracheostomy) or intratracheal instillation

OFF LABEL USE:
For nephrotoxicity prophylaxis against radiographic-contrast-induced reactions



Given orally or IV

References

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