



Nutritional
News



A ROLE FOR NUTRITION IN DRUG WITHDRAWAL PROGRAMS - A FIVE PART SERIES

Part 3: Marijuana Abuse and Withdrawal

Marijuana has been known to have some therapeutic actions within the body such as alleviating vomiting and nausea in chemotherapeutic patients. However it is more commonly recognized as a substance of abuse. Marijuana has been linked to drug induced psychosis, impaired coordination and decreased learning ability; however not all people who use the drug react in this way. This nutritional news will explore why certain individuals react to marijuana, the biochemical changes the drug induces in the body and nutritional support for detoxification programs.

Marijuana as Medicine

Tetrahydrocannabinol (THC) is marijuana's most researched constituent and is approved for medical use. Dronabinol, a synthetic form of the psychoactive substance, is available by prescription and has been prescribed for chemotherapy-induced nausea and vomiting, AIDs and glaucoma.

New research shows that marijuana may protect the brain and nervous system from injury. "A nonpsychoactive substance from the hemp plant, called HU-211, appears to reduce brain swelling and damage, diminish nerve cell death and improve recovery after head trauma and even stroke "

Marijuana, Reward Mechanisms and Addictive Behaviour

Cannabinoids appears to fulfill most of the common features attributed to compounds with reinforcing properties. Cannabinoids shown not only to activate dopaminergic neurons but also to interact with neuropeptides relevant for processing motivation such as opioids (neurotransmitter involved in euphoria) and corticotrophin releasing factor (CRH – a hormone involved in the stress response). They have also been shown to modulate the glutamate and GABA transmission in reward circuits.

Marijuana Abuse: Why Are Some More Prone Than Others?

There appears to be social, biochemical and psychological reasoning for susceptibilities to marijuana addiction. From a biochemical point of view, it may be due to the reinforcing or rewarding pathways that marijuana stimulates.

Animal studies show that low doses of THC enhance reward stimulation. This may be due to THC lowering the reward threshold. These results varied between different strains of rats. It may be hypothesized that genetic differences in these rats could account for differing responses to THC and therefore susceptibility to addictions. There appears to be an association between low dopamine (a neurotransmitter involved in reward and impulse control) and addictive behavior. Genetic links have been identified between the DRD2 gene and impulse control disorders such as drug abuse, obesity and compulsive gambling.

Marijuana Alters Neurotransmitter Balance

Recreational drugs activate dopamine neurons, and marijuana is no exception. THC and other cannabinoids have been shown to increase dopamine efflux and dopamine cell firing. Cannabinoid receptors have been shown to regulate both glutamate and GABA release in specific areas of the brain involved in reward behaviour.

Postsynaptic mechanisms involving direct interaction between dopamine D2 receptors and cannabinoid receptors have also been proposed. Marijuana has also been shown to increase melatonin to extremely high levels. A study involving eight men found that after two hours of smoking marijuana, their melatonin levels had raised to an

average of 904 pg/ml (a 45-fold increase) compared to 21.3pg/ml at the commencement of smoking.

The effect the drug will have on these neurotransmitters will vary depending on the level of exposure, strength of the drug, level of abuse and if somebody is undergoing a withdrawal program

Table 1: Proposed effects of acute & chronic marijuana use and withdrawal upon neurotransmitter balance. Question marks symbolize inconclusive evidence

Neurotransmitter	Acute	Chronic	Withdrawal
Serotonin	?	Downregulated	?
Dopamine	Upregulated	Downregulated	Downregulated
Opioids	?	?	?
GABA	?	?	?
Norepinephrine	?	?	?
Melatonin	Upregulated	?	?

Metabolism

When smoking cannabis, the majority is absorbed in the lungs. Blood concentrations after oral ingestion are 25-30% of those obtained by smoking. Cannabinoids are lipid soluble, therefore they quickly accumulate in fat stores with a low rate of excretion.¹ They have a half life of about seven days and complete elimination from the body can take up to 30 days

Nutritional Support for Withdrawal

1) Support Neurotransmitter Imbalances

*Bio Concepts Mood Disorder Appraisal may help you identify possible neurotransmitter imbalance in your patients. To gain access call the practitioner hotline on: 1800 077 113 or visit www.mda.bioconcepts.com.au

DOPAMINE: Spontaneous firing rate of dopamine neurons is reduced during cannabinoid abstinence which is likely to relate to the aversive and dysphoric consequences of cannabinoid withdrawal. To support the dopaminergic pathway during withdrawal a number of nutrients may be used. Phenylalanine and Tyrosine are amino acid precursors to dopamine. Effective absorption of these amino acids involves adequate stomach acid production. The anxiety that often accompanies withdrawal may lead to a sympathetic dominance which can inhibit adequate HCL production. Therefore hydrochloric acid supplementation, in the form of betaine hydrochloride is recommended to be taken with amino acid therapy.

Recommendations: Phenylalanine plus cofactors OR Tyrosine plus cofactors, Betaine Hydrochloride plus glutamic acid and pepsin.

SEROTONIN: Substances that enhance serotonin may also play a role in marijuana withdrawal. One study found that fluoxetine (an SSRI) appeared useful in treating substance-dependent delinquents whose major depressions persisted after 4 weeks of withdrawal. To support the serotonergic pathways adequate supply of the amino acid tryptophan is required. However tryptophan alone will not work in many cases. Essential cofactors involved in the conversion of tryptophan to serotonin include vitamin B1, B6, B3, vitamin C, calcium, folic acid, magnesium and zinc.

Recommendations: Tryptophan plus cofactors OR 5-Hydroxytryptophan

2) Support Endocrine System

During withdrawal, elevations in extracellular cortisol releasing factor can be seen which may mediate the stress like symptoms and negative effects that accompany cannabinoid withdrawal. Phosphatidylserine and Acetyl-L-carnitine have shown promising support for individuals with high cortisol levels.

Magnesium & Phosphatidylserine have been shown to prevent excessive cortisol elevation.

Vitamin B5, Vitamin C have been shown to decrease serum levels of cortisol and support adrenal function

Acetyl-L-carnitine has been shown to reduce stress induced cortisol release

Recommendations: Phosphatidylserine, Acetyl-L-carnitine, Powdered B vitamins.

3) Detoxification

A recent study in 2004 found that among users of only marijuana, hepatomegaly (enlarged liver) was observed in 57.7% and splenomegaly (enlarged spleen) in 73.1%, and slightly elevated AST (42.3%), ALT (34.6%) and AP (53.8%) suggesting that marijuana abuse can lead to liver dysfunction.

Drug withdrawal programs involves supporting the livers ability to detoxify drugs and other chemicals. There are certain nutrients that will help with both phase I (**antioxidants**) and phase II liver detoxification (**cysteine, methionine, glycine, glutamine, B vitamins, choline, vitamin C, selenium**, etc). Liver support should be gradually introduced in order to prevent exacerbation of withdrawal symptoms

Recommendations: Methionine, choline, glutamic acid, taurine, B6, folic acid
Glutathione OR cysteine plus cofactors.

4) General Nutritional Support

As with all withdrawal and detoxification programs it is essential to consider the patients general nutritional status and support this with a diet that is low in processed foods, complex carbohydrates and avoids any potential allergenic foods for the individuals. It is also essential to maintain adequate protein and essential fatty acid intake with organic meats and fish.

Recommendations: Powdered Multivitamin/Mineral with amino acids, carnitine and lipoic acid

If you have any questions regarding this article or related topics, please contact Jenny on

Orthoplex toll free number: 1800 077 113

Dr Vera's Formulations toll free number: 1800 625 934.

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