# Toxicity of Cannabis

## ESSAY

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# Abstract

The education programs can reduce drug use, provided that they use interactive methods that factor the development of interpersonal skills Most such programs are aimed at several substances usually cannabis. They may aim to increase knowledge about drugs, to reduce drug use or misuse, to delay onset of first use or to reduce the harm caused by drug use and reduce the number of news cases of problematic drug use. Mass media compaigns are apparently unable to reduce cannabis use, but they probably do increase the effect of programs and interventions. Although no medications are currently available for treating marijuana abuse, recent discoveries about the workings of the THC receptors have raised the possibility of eventually developing a medication that will block the intoxicating effects of THC. Such a medication might be used to prevent relapse of marijuana abuse by lessening or eliminating its toxicity.



Key Words :

Arachidnic acid – Camabidoil – Enzyme Immunoassays

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**Amr Reda Zaki**

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# List of abbreviation

| | |
|---|---|
| 2-AG | 2-arachidonyl-glycerol |
| 11-OH-THC | 11 HYDROXY THC |
| AA | Arachidonic acid |
| ACEA | arachidonoyl -2-chloroethylamide; |
| ACPA | arachidonoyl- cyclopropylamide; |
| ACRA | The adolescent community reinforcement approach |
| AEA | arachidonyol-ethanolamine (anandamide) |
| Akt | Protein Kinase B |
| AT | Specific anadamide transporter. |
| CBD | Cannabidoil |
| CBF | cerebral blood flow |
| CBN | Cannabinol : |
| CBT1 | cognitive behavioral therapy |
| CBT6 | six sessions of cognitive behavioral therapy |
| CBTV | Cognitive-behavioral therapy plus abstinence-based vouchers |
| CEDIA | cloned enzyme donor immunoassays |
| CE/MS | capillary electrophoresis/mass spectrometry |
| DSM-IV | Diagnostic and statistical manual of mental disorder |
| DTC | delayed control group |
| EIA | enzyme immunoassays . |
| ERK | Extracellular signal regulator Kinase |
| FAAH | Fatty acid amide hydolase |

| | |
|---|---|
| FPIA | fluorescence polarization immunoassays . |
| FSN | Family support network |
| GC | gas chromatography |
| GC/MS | gas-chromatography/mass spectrometry |
| GC-MS | gas chromatography-mass spectrometry |
| GIRK | G protein activated k+ channel |
| GPCR | G.protein coupled receptor |
| HHS | The Health and Human Services |
| HPLC | high performance liquid chromatography |
| IAI | individualized assessment and intervention |
| KIMS | kinetic interaction of microparticles in solution assays |
| LC/MS | liquid chromatography/mass spectrometry |
| LC/MS/MS | liquid chromatography tandem mass spectrometry |
| LOQs | limits of quantification |
| MAPK | Mitogen activated protein kinase |
| MDFT | multi dimensional family therapy |
| MEK | Mitogen activated protein kinase |
| MTP | Marijuana Treatment Project |
| NKS | natural killer cells |
| NMDA | N methyl D aspartate |
| NT | Neurotransmitter release |
| PI3K | Phosphatidyl inositol 3-Kinase |
| PET | positron emission tomography |

| | |
|---|---|
| PK | Protein kinase |
| PKA | Protein kinase A |
| PLD | Phosphlipase-D |
| RIA | radioimmunoassays |
| RPSG | relapse prevention and social support group |
| SMase | sphingomylinase |
| SPt | Serine palmitoyltransferase |
| SR141716A | N-(piperidin-1-yl)-5-(4-chlorophenyl)-1-(2,4-dichlorophenyl)-4-methyl- 1H-pyrazole-3-carboxamide hydrochloride, als o known as (rimonabant). |
| SR144528 | N-([1S]-endo-1,3,3 trimethylbicyclo [2.2.1]heptan-2-yl)-5-(4-chloro-3-methylphenyl)-1-(4-methylbenzyl)-pyrazole-3-carboxamide |
| THC-COOH | 11-nor-Delta(9)-tetrahydrocannabinol-9-carboxylic acid |
| TLC | Thin layer chromatography . |
| V | vouchers only |
| VGCC | Voltage gated calcium channel |

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# Introduction

Cannabis or marijuana is the most commonly abused illicit drug. It is obtained from the oldest cultivated plants, cannabis sativa and indica. It usually is smoked as cigarette (joint) or in a pipe, it might also be inhaled or taken orally . It's some times noted that the beneficial effects of smoked marijuana are greter than those of oral forms of drug as THC is absorbed rapidly and relatively reliable where marijuana is smoked, in contrast, where it's taken by mouth, THC is absorbed slowely and unpredictably from the stomach. Also after THC is absorbed from the stomach, it travel to the liver where much of it may be inactivated **(Ivrson, 2000).**

The principal psychoactive compound of cannabis is delta-9-tetrahydrocannabinol. THC attaches to specific cells in the body and alters biological activity of these cells. The attachement sites on the cells are known as receptors, two major types of receptor for THC have been identified. These are known as CB1 and CB2 receptors. The central nervous system and the immune system contain the majority of CB1 and CB2 receptors CB1 receptors are located in the central nervous while CB2 receptors predominate in the immune system **(Herkenham et al., 1990).**

The endogenous cannabinoid system has important regulatory functions throughout the body. The main endocannabinoids are small molecules derived from arachidonic acid, anadamide and 2-arachidonoylglycerol. They bind to a family of G-protein coupled receptors, of which the cannabinoid CB(1) receptor is densely distributed

in areas of the brain related to motor control, cognition, emotional responses and motivated behaviour, also the endocannbinoid system is one of the modulators of the autonomic nervous system, microcirculation and the immune system **(Rodriguez et al., 2005).**

The most important acute adverse effects caused by overdosing are anxiety, depersonalization, hallucination, impairement of motor skills and concentration and distortion in time and space perception, with regard to somatic effects increased heart rate and changes in blood pressure. Regular use of cannabis may lead to dependence and to a mild withdrawal syndrome **(Grotenhermen, 2003).**

Someone who smokes marijuana regulary may have many of the same respiratory problems as tobacco smokers do, such as daily cough , more frequent acute chest illness, a hightened risk of lung infection and greter tendency to obstructed airway **(Tashkin, 1990).**

Smoking marijuana possibility increases the incidence of developing cancer of head and neck. Marijuana smoking doubled or tripled the risk of these cancer **(Zhag et al., 1999).**

THC impair the immune system's ability to fight disease and the normal preventing reactions of many of the key types of immune cells against disease were inhibited **(Adam and Martin, 1996).**

The therapeutic use of cannabis include analgesia, muscle relaxation immunesuppressipon, sedation, improvement of mood, stimulation of appetite, antiemesis, lowering intraocular pressure,

bronchidilation, neuroprotection and induction apoptosis in cancer cells **(Grotenhermen, 2003)**.

The presence of delta 9-THC in oral fluid is a better indication of recent use than when the drug is detected in urine, so there is a higher probability that the subject is experiencing pharmacological effects at the time of sampling **(Kintz et al., 2005).**

The latest treatment data indicate, 14-session cognitive behavioral group treatment and a 2-session individual treatment that include motivational interviewing and advice on ways to reduce marijuana use, another method suggest that giving patients vouchers that they can redeem for goods such as movie passes, sporting equipment, or vocational training may further improve outcomes. Although no medications are currently available for treating marijuana abuse, recent discoveries about the workings of the THC receptors have raised the possibility of eventually developing a medication that will block the intoxicating effects of THC. Such a medication might be used to prevent relapse of marijuana abuse by lessening or eliminating its toxicity **(Budney et al., 2000).**

## Aim of the work:

Nowadays cannabis (bango, marijuana) spread on wide scale among youth and large toxic dose of it lead to death so we prepare toxicology review on cannabis toxicity to show source and history, pharmacokinetic, mechanism of action, toxic effect, and management of its toxicity.

# SOURCE AND HISTORY

## Source:

Cannabis, or hashish, or marihuana is obtained by compression of the flowering tops of the female "Hemp plants", which are known as "cannabis sativa" and "cannabis indica". Bango is obtained from the sticks and leaves of these plants **(Ashton, 2001).**

Cannabis sativa, (the Indian hemp plant) is an herbaceous annual. All parts of the plant contain psychoactive substances but highest concentrations of cannabinoids and the active ingredients, are found in the flowering head. Cannabis has been used recreationally and therapeutically for 4000 years yet an understanding of it's pharmacology is recent and incomplete **(Mechoulam, 1986).**

Cannabis sativa (American hemp), which known as marijuana or hashish depending on the particular preparation, it is a widespread illegal drug of abuse and a well-recognized medicinal plant **(Watson et al., 2000 & Iversen , 2000).**

C sativa contains ~60 phytocannabinoids, which are bioactive as defined by their ability to specifically interact with membrane-associated receptors, the cannabinoid receptors. The best-known phytocannabinoid is $\Delta^9$-tetrahydrocannabinol (THC), which is thought to mediate most not all of the psychotropic and addictive properties of C sativa **(Gaoni and Mechoulam, 1964) .**