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Medical Cannabis Use Among Individuals Experiencing Mental Illness: Facts and Unanswered Questions

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Overview

I. The Human Endogenous Cannabinoid System (ECS)

II. Medical Cannabis and Mental Illness

III. Dispensary Patient Survey

IV. Issues and Implications for the Behavioral Health Providers
I. The Human Endogenous Cannabinoid System

• All mammals are born with cannabinoid receptors throughout the body
• These protein receptors are activated by many molecules, including those found in the plant *Cannabis sativa*
• The human body produces a wide variety of molecules that also act on these proteins and are crucial for normal behavior and function
Cannabinoid Molecules

- Phytocannabinoids
  - Δ9-Tetrahydrocannabinol
  - Anandamide
  - THC
  - AEA

- Endocannabinoids
  - 2-Arachidonoylgllycerol
  - N-Stearoyl ethanolamine
How do cannabinoids exert their effects?

- Binding to receptor proteins

- Cannabinoid Receptor 1 (CB1)

- Cannabinoid Receptor 2 (CB2)

- Possible new receptors from orphan family, GPR55 and GPR18
Localization of CB1 Receptors

CB receptor localization. CB receptors are found in the basal ganglia, cerebellum, hippocampus & throughout the cerebral cortex.
Retrograde signaling through the release of 2-AG at glutamatergic and GABAergic synapses. 2-AG is synthesized by the post-synaptic cell and diffuses through the synaptic cleft where it can bind to CB receptors at the presynaptic terminal. Activation of CB receptors can produce either transient or prolonged inhibition (GLU) or disinhibition (GABA).
Recycling ECS Signaling Molecules
The ECS regulates homeostatic mechanisms and immunity

- Amygdala, medial Prefrontal Cortex, Hypothalamus, Ventral Tegmental Area, Nucleus Accumbens, and Hippocampus

The ECS has the potential to modulate a variety of subsystems
- Found on almost all presynaptic terminals (GABA, Glu, 5-HT)
- Receptor activation can initiate genomic changes

Anecdotal, human, and animal studies have all suggested a plausible role for THC and other cannabinoids in depression and anxiety specifically
Drug discovery techniques have provided a large variety of “cannabino-mimetic” molecules (i.e. JWH-133)

- Rimonabant (SR141716A)

- Marinol (Delta-9-THC)

- Sativex (50:50 THC:CBD sublingual, UK)
Cannabis & Mental Illness

Known Knowns

Known Unknowns
Cannabis and Mood Disorders

Alterations in the eCB system appear to play a key role in mood disorders. Reduced functionality might be considered a predisposing factor for major depression, so boosting the eCB tone might be a useful alternative therapeutic approach for depressive disorder.

The picture regarding eCBs and anxiety is more complicated since either too much or too little AEA can lead to anxiety states. However, a small raise in its level in specific brain areas might be beneficial for the response to a stressful situation and therefore to tone down anxiety.

Based on this last assumption, a slight increase in eCB tone only in the brain areas where it is needed could help control anxiety. This effect might be achieved with low doses of CB1 indirect agonists, such as blockers of the degradative pathway (i.e. FAAH) or re-uptake inhibitors.

Fairly consistent reporting of medical cannabis users and other cannabis users substituting cannabis for other substances, including prescription medications, alcohol, & illicit drugs

Dispensary patients cite less adverse side effects, better symptom management, and less withdrawal potential as reasons for substituting cannabis for other prescription medications.

Some anecdotal and case study reports of the utilization of medical cannabis as a harm reduction intervention among methamphetamine users, and other illicit substance abuse individuals.
Cannabis and Schizophrenia

...in individuals with a predisposition for schizophrenia, the ingestion of cannabis exacerbates symptoms and worsens the schizophrenic prognosis. In addition to cannabis producing acute psychotic like symptoms, epidemiological data suggests that cannabis is a risk factor for the onset of schizophrenia. The risk of developing schizophrenia has been reported to increase in a dose-dependent manner with increasing frequency of cannabis use and when cannabis is used in adolescence.

.....Concerning the potentiality of the pharmacological manipulation of the eCB system as a novel approach for treating schizophrenia, the experimental findings are still controversial, often with different effects depending on the drug, the dose, the species and the model used for simulating positive or negative symptoms.

Prevalence of Co-Occurring Psychiatric Illnesses in a Medical Cannabis Dispensary

Research Questions:

1. What is the prevalence of mental health diagnoses in cannabis dispensary patients?
2. What are dispensary patients’ reported patterns of cannabis use and psychological treatment?
3. What are the reported patterns of medical cannabis use between individuals with psychiatric diagnoses and those without?

• In collaboration with Bloom Dispensary, an anonymous, online survey was conducted with patients.

• Survey protocol approved by ASU Institutional Review Board

• 478 respondents
Dispensary Patient Characteristics

**ADHS Report**
*(July 2014)*

- 68.7% male
- 70.6% qualified for chronic pain
- 24.4% - 18 to 30 years of age; 19.7% 31 to 40 years of age *(mean age not available)*
- Annual income - no data available
- Race/Ethnicity – no data available

**CABHP Sample**
*(December 2013-January 2014)*

- 58.4% male
- 71.8% qualified for chronic pain
- 40.98 - mean age
- 44.9% - $50,000 & over
- 64.4% White
  - 1.7% Native American
  - 1.3% Asian
  - 4.0% African American
  - 8.6% Hispanic/Latino
  - 0.2% Native Hawaiian/Pacific Islander
  - 3.1% Other
  - 16.5% Missing
Dispensary Patient Mental Health Prevalence

Have you been told by a health professional, such as a psychologist, psychiatrist, physician or other health provider that you currently have any of the following? *(diagnosed responses not mutually exclusive; N=483)*

- 63% No reported mental disorder
- 28% Generalized Anxiety Disorder
- 14% Major Depressive Disorder
- 7% Bipolar Disorder
- 2% Personality Disorder
- 1% Psychotic Disorder
- 3% Other

9% report current mental health treatment
20% report past mental health treatment
Dispensary Patient Clinical Considerations

**Frequency of Daily Use of Medical Cannabis**

- **1 to 3**: No MH Dx 45%, MX Dx 51%
- **3 to 5**: No MH Dx 24%, MX Dx 24%
- **5 to 7**: No MH Dx 15%, MX Dx 20%
- **Over 7**: No MH Dx 10%, MX Dx 11%

**CAGE Clinical Significance**

- No MH Dx: 22%
- MH Dx: 27%

**Pain Interference**

- No MH Dx: 2.87
- MH Dx: 3.26
Areas of Reported Symptom Relief for Respondents with a Psychiatric Diagnosis

- Thoughts of suicide/death
- Major depression
- Excessive worry/anxiety
- Difficulty concentrating
- Feeling irritable
Medical Cannabis & Behavioral Health Providers

Your job just got harder!

Therapeutic use vs. illegal and abusive use

Integrating medical cannabis use and psychototropic medications

Managing substance abuse patients and drug court referrals and CJ system involved clients

Medical cannabis diversion
Systems Needs

Prescriptive Taxonomy
- Patient profiling
- Dosing
- Medicine assaying & chemical composition

Clinical Information Needs
- Clinical trials efficacy focused
- Health literacy
- Quality standards

Policy Information Needs
- Provider control and oversight
- Fee & tax revenue models
- Public safety and crime prevention
“...as physicians know how to do with gauging patients' consumption of alcohol, nicotine and various opiate preparations, they should demand and expect honesty of their patients, take histories of their cannabis ingestion, monitor for signs of pathological use, discuss the risks and benefits with them and counsel them from a stance of knowledge and respect about curtailing problematic consumption.”

Your Questions and Comments
References