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Review Article

" PSYCHIATRIC ILLNESS AND CANNABIS: A GROWING PUBLIC HEALTH CONCERN"

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ABSTRACT

Cannabis is one of the most widely used psychoactive substances in the world. Its use is increasing every year due to its increased social acceptance and legalization. Cannabis is made up of over 460 chemical compounds, including 60 different cannabinoids. Delta-9-tetrahydrocannabinol (THC) is the principal psychoactive component of cannabis. Cannabinoids exert their effects largely due to their interaction with the endogenous endocannabinoid system, which is critical for neurodevelopment and neurophysiological homeostasis. Recently, many studies have established a strong relationship between cannabis use and anxiety, depression, psychosis, and cognitive dysfunction. This paper seeks to review the literature on the neurobiology, clinical outcome, and public health implications of the associations between cannabis use and psychiatric illness. The authors suggest developing preventive strategies, public awareness campaigns, and government policies to respond to the growing burden of cannabis-related psychiatric disorders.

Keywords: cannabis, psychiatric illness, THC, addiction, endocannabinoid system.

Introduction

Cannabis is a psychoactive drug that is one of the most commonly used drugs worldwide. The plant *Cannabis sativa* has been used throughout recorded history for recreational, medicinal, and spiritual purposes. In modern times, social media usage is becoming more and more legal and normalized, but there are some concerns that it may harm mental health. Cannabis use is increasing in the general population, particularly among adolescents and young adults. Use has been reported to have exceeded cigarette smoking in some populations. The reason for such a shift is to understand the effects of cannabis use on psychiatric disorders better. This paper examines the association between cannabis use and psychiatric illness from the perspective of neurobiology, clinical psychiatry, and public health.

Chemical Composition of Cannabis

Cannabinoids, terpenes, flavonoids and related compounds characterize cannabis. Over 460 compounds have been identified in cannabis, with 60-100 of those classified as cannabinoids and used for theoretical pharmacological understanding. The main cannabinoids include:

- Delta-9-tetrahydrocannabinol (THC): A principal psychoactive component of cannabis that is mainly responsible for the "high" of cannabis use.
- Cannabidiol (CBD): non-psychoactive compound with potential therapeutic applications.
- Cannabinol (CBN) is a mildly psychoactive compound formed from the breakdown of THC.

The principal active chemical likely responsible for such psychiatric effects is THC, which binds directly to brain cannabinoid receptors.

Endocannabinoid System and Mechanism of Action

The endocannabinoid system (ECS) is a biological system involved in the regulation of mood, cognition, appetite and pain, comprising: Cannabinoid receptors (CB1, CB2), Endogenous ligands (anandamide and 2-AG), Enzymes that synthesize and degrade molecules.

THC has a high binding affinity for CB1 receptors, which are concentrated in areas of the brain responsible for memory, affect, and higher-order cognitive function such as the hippocampus, amygdala and prefrontal cortex. THC alters neurotransmitter release, disturbing normal communication between nerve cells leading to impaired cognitive function, altered perception and emotional dysregulation. The ECS (endocannabinoid system) is involved in both prenatal and postnatal neurodevelopment, and subsequently disrupting this system during adolescence may have long-lasting effects in terms of psychiatric illness.

Cannabis Use and Psychiatric Disorders

Anxiety Disorders

Cannabis use is commonly associated with symptoms of anxiety. Low doses of tetrahydrocannabinol (THC), the main psychoactive constituent of cannabis, produce a relaxing effect, but higher doses may cause anxiety and panic. Continued use may worsen underlying anxiety disorders.

Depression

Multiple studies show an association between cannabis use and the risk of developing depressive disorders. The association appears to be bi-directional with cannabis possibly causing depression due to neurochemical changes and decreased motivation.

Psychosis and Schizophrenia

The most prominent and well-established association is the association between cannabis use and the risk of psychotic disorders. THC is known to cause acute psychotic symptoms, including hallucinations, delusions, and disordered thinking. For genetically vulnerable individuals, long-term and early cannabis use in adolescence considerably increases the risk of developing schizophrenia and other psychoses.

Cognitive Impairment

Cannabis affects cognitive functions including attention, memory, and learning. Heavy cannabis use may lead to persistent cognitive impairment, particularly in adolescent users.

Addiction and Dependence

Cannabis use disorder is a pattern of cannabis dependence with tolerance and withdrawal symptoms that include irritability, insomnia, and appetite loss.

Vulnerable Populations

Adolescents

However, as adolescents are still developing, cannabis use at that stage of life increases the risk of long-term cognitive and emotional problems.

Pregnant Women

Cannabis exposure prenatally has been associated with adverse effects on development of the foetal brain and cognitive and behavioural outcomes.

Genetic risk factors

People with a family history of psychiatric illness are at high risk of cannabis use-related mental illness.

Public Health Implications

Cannabis use can have broad implications for health systems and range from the following:

- Increase in cannabis-induced mental health disorders

- Increased healthcare burden
- Decreased productivity and social functioning
- Impact on youth and future generations

These issues are compounded by the normalization of cannabis use and misconceptions about the drug's safety.

Preventive Strategies

Awareness and Education

Public awareness and information campaigns are among the most effective preventive approaches to reducing the incidence of problematic use of cannabis. They should aim to provide information on short- and long-term effects of cannabis at physical, psychological, and social levels. Interventions may be implemented in schools, colleges, hospitals, social media, television, and community campaigns. Because adolescents and young adults are at greater risk of cannabis use and experimentation, interventions should include this population group. Education campaigns about cannabis should target misconceptions about cannabis (such as it being harmless) and inform cannabis users about its possible negative effects, such as an increased risk of dependence, cognitive impairment, academic difficulties, anxiety, psychosis, and depression.

Early Intervention

Early identification and intervention may help prevent cannabis use from developing into dependence or cannabis use disorder. Screening programs in schools, colleges, primary healthcare settings and mental health clinics are one method of early identification of cannabis use and misuse. Brief counselling, motivational interviewing (MI), and psychological support when use is regular can avoid the harmful consequences of continued use. This is particularly important among adolescents, people with a family history of substance use, and individuals with existing mental health problems. Early intervention reduces the long-term risk of psychiatric consequences and improves the prognosis for those affected.

Policy Measures

Comprehensive public health policies for the availability, sale and distribution, advertising and promotion, and legal minimum age for cannabis use may also delay or prevent the use of cannabis and other psychoactive substances, particularly among youth. Monitoring, warning labels on products, and penalties for illegal manufacture and distribution are also helpful. Policies should provide support to medical use in jurisdictions where it is legal and reduce recreational use and related misuse and abuse. Evidence-based regulation can reduce availability and social normalization of cannabis use.

Community-Based Programs

Several community services can act as prevention, rehabilitation, and recovery resources. Community counselling centres, peer groups, school mental health services, family education programs, and de-addiction services can all help individuals and families understand substance use, how to identify warning signs, and when to obtain early intervention or treatment. Engagement of parents, teachers, and health workers and training of community leaders can strengthen prevention, while rehabilitation helps with reintegration and relapse. Supportive community environments help individuals develop alternative coping strategies and reduce stigma when seeking help.

Discussion

Cannabis use and the development of psychiatric disorders are associated, but the relationship is complex. Cannabis' effect on mental health depends on other factors, including the quantity of use, individuals' age at first exposure, their frequency of exposure, their genetic vulnerability, and the chemical composition of the cannabis. Despite its recognized therapeutic use in a limited number of medical conditions, increasing evidence shows cannabis is a potentially meaningful cause of psychiatric morbidity, especially in vulnerable individuals.

Tetrahydrocannabinol (THC) is the most prominent psychoactive constituent of cannabis, its effects coming mainly through cannabinoid receptors in the brain, particularly CB1 receptors. These are found throughout the brain but are most concentrated in the prefrontal cortex, hippocampus, amygdala, and basal ganglia, four regions involved in the regulation of mood, cognition, reward, memory, and perceptions. THC alters the release of neurotransmitters, affecting neuron communication. This causes temporary effects including euphoria, altered sensory perceptions, anxiety, panic, impaired concentration, and changes in short-term memory.

Long-term heavy use has been linked with a number of psychiatric problems, with psychosis, particularly schizophrenia-spectrum disorders, being the most reliable association. Frequent cannabis use, early (adolescent) onset of cannabis use, and the use of high-potency cannabis have been associated with paranoia, hallucinations, and delusional (psychotic-like) symptoms. Cannabis use may lead to an earlier onset of psychotic illness or a poorer course of illness in individuals with a personal or family history. Cannabis use is associated with mood disorders, including depression and bipolar disorder, and as a result, people may use the substance to temporarily relieve depressed mood or emotional distress. Long-term cannabis use, however, has been associated with worse depression, poorer motivation, and poorer emotional regulation. In those with bipolar disorder, cannabis use has been associated with more manic episodes, poorer adherence to treatment, and poorer functioning. In humans, the effects on anxiety are mixed. Low doses of THC appear to be anxiolytic, while high doses are anxiogenic, inducing anxiety, panic attacks, restlessness, and depersonalization, particularly in inexperienced users or those with a past history of anxiety disorder.

Adolescents and young adults are considered to be particularly vulnerable to the adverse effects of cannabis, as the human brain is still developing in early adulthood. Neurodevelopmental effects on cognition, attention, learning, executive function, and emotional regulation have all been documented following cannabis use during this period. There is some evidence that chronic early users have persistent deficits in memory and decision-making. Another issue of concern is the increased potency of cannabis. In particular, over the past few decades the concentration of tetrahydrocannabinol (THC) in cannabis products that are sold has increased while the concentration of cannabidiol (CBD), which can reduce the psychotropic effects of THC, has declined. This would also likely lead to stronger psychoactive effects and a greater potential for psychiatric side effects than with regular cannabis.

At the same time, cannabis is not a purely harmful drug. There are indications for its medical use in chronic pain, nausea and vomiting due to chemotherapy, spasticity due to multiple sclerosis, and certain seizure disorders. In these cases, dosing is controlled, medical supervision is maintained, and there is medical knowledge of the individual's psychiatric history, which is not present in recreational use.

At the least, there is sufficient evidence to take a balanced and evidence-driven public health approach to informing the use of cannabis that includes awareness of mental health risks, along with prevention efforts for young people, those at psychiatric risk, and high-potency product users. Future research will clarify the dose-response relationship, genetic and environmental risk factors, the role of THC and CBD, and long-term psychiatric outcomes. This knowledge will enable clinicians to use cannabis with fewer harms, inform public policy, and ease consumer decision-making about the use of cannabis.

Conclusion

Cannabis use has been associated with various psychiatric disorders, including anxiety, depression, psychosis, and cognitive impairment. Cannabis may be a risk factor for certain mental disorders, but this association remains debated. A better understanding of the neurobiological mechanisms underlying these effects and the implementation of public awareness, policy and research are needed to address the cannabis associated psychiatric illness epidemic.

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