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CANNABIS A REVIEW AND ITS THERAPEUTIC POTENTIALS

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ABSTRACT

Cannabis or (Bhang in India) is generally known for its toxic effects in human being but, in fact it is as an oldest known psychoactive drug which is used since ancient time as recreational drug. It is also famous for its hemp oil and hemp fibre as well. Various preparations of cannabis are in use, including hashish and hash oil which, are extracted from the plant.It is also termed as Marijuana which is slang term for portions of the Cannabis plant. Hundreds of compounds are present in this plant but the compound which is believed to be responsible for its phpsychoctive activity is tetrahydrocannbinol (THC). The mechanism suggested for this molecule is that it binds to cannabinoid receptors throughout the body, and when it binds to brain it gives a feeling of pleasure, time perception and pain. The present article briefs all the aspects of plant including its therapeutic potential for various diseases.

Key Words: Cannabis, Marijuana, Psychoactive Drugs, Drug Addiction

I. INTRODUCTION

Cannabis is commonly called as Bhang or Marijuana and is a majorly used as a psychoactive drug or medicine. It is a genus of flowering plant that includes three species or subspecies (*sativa,indica,* and *ruderalis*) and seven taxas. The part of plant for cannabis which is mainly taken into consideration are flowers and leaves in which flowers are dioecious having male and female flowers in separate plants. The plant is indigenous to Central Asia and Indian subcontinent. The possession, use and sale of cannabis are illegal in most of the countries of world. Medical cannabis refers to physician-recommended use of cannabis which is taking place in Canada, Belguim, U.S, and India etc. Cannabis has also been used for hemp fiber, hemp oils, medicinal purposes, and as a recreational drug, since long time.

Marijuana has been used by people for enjoyment due to addiction. In the 1960s, Dr. Rafael Mechoulam isolated and identified the cannabinoids and the chief cannabinoid chemical in the marijuana plant: delta-9-THC.[1] The plant contains between 2-10% THC (delta-9-tetrahydro cannabinol) [2] one of 483 known compounds in the plant, including at least 65 other cannabinoids known for its psychotropic properties. Regular consumption of cannabis can lead to several pathological conditions to the user. It is being consumed by people for enjoyment in following various ways.

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II. WAYS OF CONSUMPTION OF CANNABIS

2.1 Smoking - people smoke marijuanin hand-rolled cigarettes or paper-wrapped joints or tobacco-leaf-wrapped blunts, and in pipes or water pipes/bongs.

2.2 Cannabis oil and tea - tea is made by first adding a saturated fat to hot water (e.g. Cream or any milk except skim) with a small amount of cannabis. They contain relatively small concentrations of the oil (lipophilic) and is only slightly water-soluble (with a solubility of 2.8 mg/liter). Cannabis oil can also be applied to skin either pure or diluted with virgin oil. They both are legal as they have low THC content.

2.3 Edibles - users can mix marijuana in food such as brownies, candy or cookies. Bhang also an edible preparation of cannabis is traditionally and popularly been used in food and drinks for centuries in Indian subcontinent mainly during festivals.

III. MECHANISM OF ACTION

The major components of this plant are called as cannabinoids. Cannabinoids are of mainly two typesendocannabinoids and exocannabinoids. Some common endocannabinoids are anandamide and 2-archidonoly glycerol (2-AG). THC or Tetrahydrocannabiol is a main exogenous cannabinoid. The cannabinoids act as ligand to certain receptors present in the body known as cannabinoid receptors. CB1 receptor or cannabinoid receptor type 1 is the primary receptor for cannabinoids; it is mostly located in the central and the peripheral nervous system. Another receptor is called as cannabinoid receptor type 2 or CB2 receptor [3]. CB2 receptor is mainly found in the peripheral tissue. CB1 receptors are present in high amount in the basal gangila and the cerebellum region of the brain. The basal gangila is responsible for coordination in movement and the cerebellum is responsible for motor control. Thus, cannabis causes problems in psychomotor control. CB1 receptor has also been found in the hippocampus region which is responsible for memory. Thus, cannabis is also responsible for short term memory impairment. THC has been known to also increase the appetite of a person mainly food consisting high fat in it. CB1 antagonist rimonabant has the opposite effect of THC and thus causes a decrease in appetite. Another effect of THC and certain synthetic cannabinoids can be used as anti-emetics meaning that they can help in controlling nausea and vomiting, which is helpful for cancer patients undergoing chemotherapy**.** [4]. Acute use and long term use of cannabis has different types of effect on the user.

IV. ACUTE EFFECTS OF CANNABIS

The acute toxicity of *Cannabis* is very low and no deaths have been directly attributable to their recreational or therapeutic use. Some of the adverse effects commonly observed are mild euphoria and relaxation, perceptual alterations, including time distortion, and the intensification of ordinary sensory experiences, such as those associated with eating, watching films and listening to music [5].

The Euphoriant effect varies greatly with dose, mode of administration, expectation, environment and personality of the consumer [6]. Perceptual changes induced by *cannabis* and THC affect all sensory modalities like sound perception may be heightened, temporal and spatial perception is distorted so that judgment of distance and time are impaired [7].

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The effects of *cannabis* on thought processes are characterized initially by a feeling of increased speed of thought, flights of ideas which may seem unusually profound and crowding of perceptions [8]. With higher doses of *cannabis*, thoughts may get out of control, become fragmented and lead to mental confusion. It causes a specific deficit in short term memory, an effect which is demonstrable even after small doses in experienced *cannabis* users. The deficit appears to be in acquisition of memory and may result from an attentional deficit combined with an inability to filter out irrelevant information and intrusion of extraneous thoughts [9]. Impaired motor performance have been shown in many studies in humans, including tracking ability, pursuit rotor performance, hand-eye coordination, physical strength and many others [10].
The observable effects immediately after consumption are reddening of eyes, reduction in body temperature, dry mouth and throat, hunger, slightly elevated heart rate and blood pressure when lying down and a drop in heart rate and blood pressure when standing [11][12][13]. Heart rate may increase to 20%-50% over baseline and this tachycardia occurs within a few minutes and can last up to 3 hours [5]. If dose is of low potency, effects can be subtle and brief although if repeated smoking is done, the effects can last for hours [14].
A number of studies have attempted to correlate plasma concentrations of delta-9-THC and its metabolites with the psychoactive effects of *cannabis* in order to deduce the extent. Of the intoxicated state currently being experienced by an individual, or to determine when *cannabis* was last used. However, this is far more difficult than with alcohol because of the many factors that affect the pharmacological action of *cannabis*. Peak plasma concentrations do not correspond to the point of maximum intoxication when *cannabis* is inhaled (smoked), injected intravenously or ingested (eaten or drunk). More recent mathematical models are thought to permit more accurate assessment of the time that has elapsed since *cannabis* was last consumed [15]. The effect of *cannabis* depends not only on its composition, dosage and mode of consumption; much also depends on the mood of the individual, on the individual's expectations, and on the atmosphere and setting. These factors explain why the altered state of consciousness, which may amount to pronounced intoxication, is experienced so differently by different people.

V. LONG TERM USE EFFECTS

In long term cannabis can reduce resistant to illness (colds and bronchitis, etc) ref. It is also known to Increase of abnormally structured cells in the body ref. It is has been shown to have effect on male fertility as male sex hormone are also seen to be reduced [16]. Long term use of cannabis can also lead to personality and mood changes [17] along with it also reduces reduced ability to learn and retain information[18]. It can lead to various problems in various parts of the body such as problems associated with the oral cavity: Uvulitis and nicotinic stomatitis. These two appear to be the two most common of the several oral manifestation of cannabis use [19].
With a long term use of cannabis, respiratory system also becomes weak and prone to diseases, and symptoms like: cough, increased sputum production and wheezing become frequent. It is also associated with dyspnea, pharyngitis, hoarsening of the voice and the exacerbation of asthma [20]. Both *Cannabis* and Tobacco smoking cause significant Bronchial damage. There is an increased risk of airflow obstruction in smokers [21].
Cannabis use significantly increased the risk of nasopharyngeal carcinoma also which is independent of cigarette smoking *but does not i*ncrease the risk of head and neck cancer [22] [23].

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VI. WITHDRAWAL SYMPTOMS

If, a person has been using cannabis for long and now plans to leave its habit, it is not so easy for that person to do so as, one has to go through the withdrawal symptoms of Cannabis (CWS). These symptoms include irritability, anger or aggression; nervousness or anxiety; sleep difficulty (insomnia) etc [24]. *Cannabis* withdrawal is clinically significant because it is associated with elevated functional impairment of normal daily activities [25].

VII. THERAPEUTIC USES OF CANNABIS

The toxic effects of cannabis are being discussed more frequently among the people but it is also important to mention that it also has various therapeutic applications and cannabinoid group is majorly responsible for such effects of cannabis. As said earlier Cannabinoids is the group of diverse chemical compounds which are majorly found in this plant. Each cannabinoid is known to have 20 potential health benefits on our health. Some of the general health benefits of cannabis are Relief in Pain, Reduction in Inflammation, Promotion of Bone Growth, Reduction in Nausea and Inhibition of Cancer Growth. [26]. Following are few benefits associated with cannabis.

7.1 Dry skin – eczema, hair and eyes

Hemp oil is exceptionally rich in vitamins and Omega acids which is consequently of great help in combating numerous diseases including cardiovascular and blood problem. It also restores shine to hair and tones the scalp from dry and dehydrated skin.[27]

7.2 Digestion – lack of appetite

It is very effective for restoring apetite to those suffering from anorexia, increases appetite and hunger (particularly the raisins and seeds) and balances intestinal flora, helps to prevent colon and intestinal cancer (synergy with turmeric and ginger), It also combats nausea vomiting and irritable bowel syndrome through leaves. [28]. Cannabinoids has also been used in the case for anorexia caused by antiviral drugs, AIDS and terminal cancer. [29]

7.3 Insomnia – sleep and dreams

It helps in falling asleep, improves quality and duration of sleep. It also increases ability to remember dreams. It reduces anxiety prior to falling asleep in association with lemon and ashwagandha. [30].

7.4 Stress –pain, anxiety and depression

Cannabis is a powerful pain reliever whose main effects are anaesthetization and soothing of pain. It reduces anxiety, irritability, agitation, stress, nervous exhaustion, and depression. [31]. Cannabis is a powerful anti-depressant that plays a role in nervous system and regulates dopamine. Pain can be reduced considerably notably during chemotherapy. This is also helpful for AIDS patients suffering from aids related wasting syndrome. [29].

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7.5 Spastic disorders:

Muscle spasticity with recurrent painful muscle cramps and various combinations of weakness, tremor, etc occurs in a number of chronic neurological conditions including multiple sclerosis, cerebral palsy and spinal cord injuries. Cannabinoids are reported to be of therapeutic value in neurological disorders associated with spasticity and muscle weakness, because very similar symptoms can be caused by cannabis itself. [32]

7.6 Glaucoma:

Several studies have shown that smoked or orally administered cannabis can decrease IOP (intraocular pressure), which is the fluid pressure inside the eye, which is damage due to glaucoma [33].

7.7 Mood disorders and psychiatric conditions:

Cannabis and cannabinoids have been advocated as antidepressants to reduce depression. It also helps in reducing irritability or excitement thereby acting as an tranquillizer and sedatives thus helping in with different mood disorders that a person goes through in severe psychiatric and medical conditions. [34]

VIII. CONCLUSION

In conclusion it can be said that cannabis has a huge potential to look into for therapeutic uses. Though there are no convincing evidences that state that cannabis is superior to the existing drugs for the above mentioned problems but surely is therapeutic to the above conditions. In depth research is required to establish the complete mechanism of action of this plant. There are many other chemical constituents are present in this plant other than THA and they may also be explore for their potential and mechanism of action.

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