

## PSYCHIATRIC ASPECTS OF MARIHUANA INTOXICATION Samuel Allentuck, MD, and Karl Bowman, MD

Introduction by David Solomon: (The Marihuana Papers)

Because it flatly contradicted many of the marihuana myths, the following paper caused something of a stir both in the press and in medical circles when it was read at the ninety-eighth annual meeting of the American Psychiatric Association, held in Boston in May 1942. The findings of Dr. Allentuck and Dr. Bowman—both practicing psychiatrists—were based upon exacting studies which they conducted for the Mayor's Committee on Marihuana. Dr. Allentuck, whose medical degree is reinforced by a doctorate in biochemistry, was the clinical director of the Committee.

"The Psychiatric Aspects of Marihuana Intoxication" was originally published by the American Journal of Psychiatry in September 1942. It has since taken its place as one of the key reference works in the medical literature on marihuana.

Marihuana has been known as a passport to euphoria since ancient times. It has fascinated men of imagination, and descriptions of its effects upon the mind and body have been given in popular and scientific literature countless times. The literature has been adequately considered by Walton (1) and by Bromberg (2), and will therefore not be reviewed at the present time.

The observations to be presented here are based on research conducted in New York City under the auspices of the Mayor's Committee on Marihuana. Studies were made of the effect of marihuana on a series of 77 subjects, including some who had previously used marihuana for varying periods—of time. The work was done at Welfare Hospital with the assistance of Drs. Frank Anker and Louis Gitzelter. A monograph based on this and collaborative work is now in the course of preparation, and deals with the pharmacological, clinical, therapeutic, social, psychological, and psychiatric aspects of marihuana. This paper consists mainly of a description of the psychiatric manifestations caused by the drug.

The active principle in the plant is an oil, occurring in maximum concentration in the flowering tops. The drug is ingested or inhaled after being prepared for use in various ways in different parts of the world. In this hemisphere it is usually smoked, but may be eaten in the form of

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candy, or drunk in various liquid preparations. The strength and quality of the effect of marihuana vary with the geographical source of the plant. It is strongest in the African derivative, less strong in its Central American form, and weakest as found in the temperate zones of this country.

Marihuana is unique in the reactions it produces in the users, although its physiological effects have been likened to those of the atropine group of drugs, and its psychic effects to those of alcohol. The following is a clinical picture of the sequence of events resulting from the ingestion of marihuana. The sequence of events is the same whether the drug is ingested or inhaled, but the latter produces its effects more rapidly.

Within one-half to one hour after the ingestion of marihuana the conjunctiva reddens, the pupils dilate and react sluggishly to light; photophobia, lacrimation, tremulousness of the eyelids, and nystagmus upon lateral gaze become evident. Ophthalmoscopic examination reveals nothing unusual in the nerve head, vessels or retinal background. The vision for distance, proximity, and color changes but slightly. The tongue becomes tremulous and dry, and the mouth and throat parched, suggesting a diminution in salivary secretion. Cardiovascular changes consist of an increase in the radial pulse rate and a rise in the blood pressure which closely follows the pulse increase. The extremities become tremulous, and there are involuntary twitching, hyperreflexia, increased sensitivity to touch, pressure, and pain stimuli. Pyramidal tract signs are not elicited. There is equilibratory and nonequilibratory ataxia, as revealed by marked swaying and abnormal finger-to-finger test performance. Not all of these phenomena occur in every subject, but when any of them does, it lasts for about twelve hours. Elaborate laboratory studies of the effects of marihuana intoxication for shorter and longer periods, on users and non-users, reveal no significant systematic alterations.

Mental phenomena arise two to three hours after ingestion, or almost immediately after inhalation of the drug. The subject admits being "high." This state is characterized by a sensation of "floating in air," "falling on waves," lightness or dizziness in the head, ringing in the ears, and heaviness in the limbs. Euphoria is first manifested objectively in volubility and increased psychomotor activity, and later subjectively in a delicious and confused lassitude. Distance and time intervals subjectively appear elastic. In three to six hours after ingestion of marihuana, hunger, manifested mainly in a craving for sweets, and a feeling of fatigue and sleepiness become prominent. The individual may sleep from one to six hours and on awakening is "down", that is, he no longer feels "high." The clinical phenomena may linger for another few hours.

The mental status usually reveals a hyperactive, apprehensive, loquacious, somewhat

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suspicious individual. His stream of talk may be circumstantial; his mood may be elevated, but he does not harbor frank abnormal, mental content such as delusions, hallucinations, phobias, or autistic thinking. Attention, concentration and comprehension are only slightly disturbed, as is evidenced by the fact that the results in his educational achievement tests are only slightly lowered.

Marihuana may precipitate a psychosis in an unstable, disorganized personality, when it is taken in amounts greater than he can tolerate. Under such circumstances, the previously mentioned physical and psychic manifestations become quantitatively greater and new events arise. The respiration becomes labored; pallor and perspiration become evident; tachycardia and irregularity of pulse occur. The subject complains of urinary urgency, diarrhea and nausea; and may retch or actually vomit. His apprehension may be interrupted by laughing and weeping, by volubility or mutism. Marked irritability, negativism, and cerea flexibilitas-like phenomena may be elicited. The subject may assume grotesque, statuesque positions. He may experience visual pseudohallucinations in the form of flashes of light and apparitions. Micropsia and macropsia may occur. More intense intoxication may elicit auditory hallucinations similar to those met with in the alcoholic psychoses, such as alcoholic hallucinosis or delirium tremens.

Limitations of time will not permit detailed description of the nine psychoses precipitated in our series of 77 subjects. However, it should be noted that a characteristic marihuana psychosis does not exist. Marihuana will not produce a psychosis de novo in a well-integrated, stable person. In unstable users the personality factor and the mood preceding the ingestion of marihuana will color any psychosis that may result. In no two of the cases developing psychoses in our series were the patterns similar. Marihuana psychosis is protean in its manifestations and may be mistaken for schizophrenic, affective, paranoid organic, psychoneurotic or psychopathic reaction types. Should a psychosis be precipitated in an unstable personality it may last only a few hours or it may continue for a few weeks. It may be controlled by withdrawal of the drug and the administration of barbiturates. After a few hours of sleep following the psychotic episode treated with barbiturates, the patient may awaken with complete memory for his experience and with his insight unimpaired.

The prolonged effects of the drug are strongly subjective, and consist of an increase in fatigability and vague generalized aches and pains. The aftermath of marihuana intoxication resembles an alcoholic "hangover." However, in contrast to alcoholics, marihuana users do not continue their indulgence beyond the point of euphoria, and soon learn to avoid becoming ill by remaining at a pleasurable distance from their maximum capacity for the drug. It may be mentioned that marihuana is no more aphrodisiac than is alcohol. Unlike damiana, yohimbin, testosterone propionate, etc. which produce genital engorgement directly, marihuana, like alcohol, acts only indirectly through the cerebral cortex in this respect.

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Marihuana differs from the opium derivatives in that it does not give rise to a biological or physiological dependence. Discontinuance of the drug after its prolonged use does not result in withdrawal symptoms. The psychic habituation to marihuana is not as strong as to tobacco or alcohol. Use of marihuana over a long period of time may conduce to ingestion of progressively larger amounts merely through accessibility and familiarity. This increment however does not give rise to a more intense pleasurable experience. Thus a person experiencing pleasure with two marihuana cigarettes does not achieve any greater pleasure with six cigarettes, though he may indulge in them.

A physiologically active constituent has been isolated from the crude marihuana by Dr. Roger Adams and his associates, working in the Noyes Chemical Laboratory of the University of Illinois, in Urbana, as was reported by Dr. Adams in his Harvey Lecture in February 1942. This substance or its synthetic equivalent elicits somatic and psychic phenomena identical to those obtained with the crude drug. Only brief mention need be made of these substances since they are explained in detail in Dr. Adams' report. Thus, natural tetrahydrocannabinol is obtained by the isomerization of cannabidiol, through the action of p-toluene sulphonic acid. Synthetic tetrahydrocannabinol is 1-hydroxy-3-n-amyloxy-6,6,9-trimethyl-7,8,9, 10-tetrahydro-6-dibenzopyran. Another synthetic equivalent called synhexyl is 1-hydroxy-3-n-hexyloxy-6,6,9-trimethyl-7,8,9, 10-tetrahydro-6-dibenzopyran. The natural product is most potent, the synthetic equivalent least potent, and the synhexyl ranks between them.

In the course of our investigation we studied the therapeutic application of marihuana derivatives and allied synthetics to opiate drug addiction, functional and organic depressions, and psychoneurotic disorders in which dysphoria and anorexia existed. The rationale for such therapeutic use was that, while exerting no permanent deleterious effects, marihuana or its derivatives or synthetics give rise to pleasurable sensations, calmness and relaxation, and increase the appetite.

A series of cases were selected from among drug addicts undergoing treatment. Subjective and objective criteria were employed. Comparative results were charted for the gradual withdrawal, total withdrawal, and marihuana derivative substitution, as methods of treatment. A modification of the technic of Kolb and Himmelsbach was employed in studying the abstinence syndrome. Forty-nine subjects were studied. The results in general, although still inconclusive, suggest that the marihuana substitution method of treatment is superior. Thus, the withdrawal symptoms were ameliorated or eliminated sooner, the patient was in a better frame of mind, his spirits were elevated, his physical condition was more rapidly rehabilitated, and he expressed a wish to resume his occupation sooner.

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In conclusion it is worthy of note that marihuana is probably taken by its users for the purpose of producing sensations comparable to those produced by alcohol. It causes a lowering of inhibitions comparable to that elicited by alcohol in a blood concentration of 2-3 mg. per cent. The user may speak and act more freely, is inclined to daydreaming, and experiences a feeling of calm and pleasurable relaxation.

Marihuana, by virtue of its property of lowering inhibitions, accentuates all traits of personality, both those harmful and those beneficial. It does not impel its user to take spontaneous action, but may make his response to stimuli more emphatic than it normally would be. Increasingly larger doses of marihuana are not necessary in order that the long-term user may capture the original degree of pleasure.

Marihuana, like alcohol, does not alter the basic personality, but by relaxing inhibitions may permit antisocial tendencies formerly suppressed to come to the fore. Marihuana does not of itself give rise to antisocial behavior.

There is no evidence to suggest that the continued use of marihuana is a stepping-stone to the use of opiates. Prolonged use of the drug does not lead to physical, mental, or moral degeneration, nor have we observed any permanent deleterious effects from its continued use. Quite the contrary, marihuana and its derivatives and allied synthetics have potentially valuable therapeutic applications which merit future investigation.

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