Physician's Role In The Battle Against Drug Addiction

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Investigations over the past two years have indicated that there is an upward trend in drug addiction and that the increase is predominantly among the younger members of society. Addiction has been compared to a contagious disease and the more our attitude toward addiction approximates our attitude toward contagious disease, the better will be our understanding and control of addiction. Physicians can do much towards combatting the drug addiction problem by keeping themselves thoroughly informed of the characteristics and recognition of addicts and by an informed attitude toward the handling of an addict which constitutes adequate quarantine and institutional treatment.

Addiction is no longer a problem simply of the opiates. The new synthetic analgesics and the rising abuse of barbiturates is of the greatest importance.

Addiction-producing substances fall into one of four (4) classifications:

(1) Morphine and transformation products, (2) synthetic analgesics and (3) sedatives (barbiturates) and hypnotics, (4) Miscellaneous group.

Morphine is the best known and most widely used compound of proved addiction liability. It is a powerful analgesic.

A derivative of morphine is codeine, which also occurs in opium. It is a much weaker analgesic agent than morphine, yet none the less is addiction producing.

Another derivative of morphine is heroine which is a strong and fast acting analgesic which rapidly gives rise to addiction. It is the drug of choice in illicit drug traffic due to its potency and ready accessibility by simple chemical change of morphine. It is morphine-like in all respects and can do nothing clinically which cannot be accomplished by other drugs less prone to abuse.

Dilaudid, also a morphine derivative, has the same general properties as morphine.

Other analgesics of the morphine group are dionin, peronin, dicodid, metopon and 6-Methyldihydromorphine. Metopon is more potent than morphine and has less addiction liabilities, 6-Methyldihydromorphine is as effective as morphine with much milder intensity of abstinence phenomena following withdrawal.

Among the Synthetic Analgesics are Meperdine and Related Com-

pounds (dolatin, demerol, pethidine). Meperdine has physiologic properties similar to morphine. It is one-eighth as effective as morphine, but the effects of addiction to this drug are so pronounced that it is even more undesirable than is addiction to morphine. Cliradon, also in this group is 20 times as effective as morphine, but is as addictive as heroin. Another drug of this group is Nisentil with a weaker analgesic action than morphine, and also addicting.

Also among the synthetic analgescia is the Methadone series. Its analgesic and drug addicting properties resemble morphine. Other drugs in this group are dl-Isomethadone, heptazone, and an alcohol, Methadol. This alcohol is as effective as morphine and will substitute completely in addicted persons provided substitution is made 24 hours before morphine is discontinued.

Another group of Synthetic Analgesics are the Morphinan types. These have four times the analgesic effect of morphine, but is six times as toxic.

The Dithiehyl-butenes, the last of the class of synthetic analgesics is about as addicting and as effective pharmacologically as is morphine.

The Third Group of addiction-producing substances are the Sedatives which are barbiturates and Hypnotics. Addiction to these substances is common, and is similar to chronic alcoholism but is far more harmful than is addiction to morphine or other drugs. The short acting nembutal, amytal and seconal are preferred by addicts to the milder, longer acting phenobarbital and barbital. Withdrawal of barbituates from addicts is followed by severe withdrawal symptoms.

Among the hypnotics are paraldehyde, chloral hydrate and alcohol. Addiction to paraldehyde and chloral hydrate is uncommon, but the abstinence syndrome produced by these drugs is identical with that produced by the barbiturates.

Among the addicting drugs of the Miscellaneous group are Marihuana (or hashish), Cocaine, Mescaline and Benzedrine. Marihuana gives only mild intoxication except for scattered transient psychoses. No tolerance is developed and there is no abstinence syndrome. Abuse of this drug has become a social problem and is often the first step on the road to morphine addiction.

Cocaine, Mescaline and Benzedrine are addiction producing. There is no tolerance developed however with any of these stimulant drugs and there are no true withdrawal symptoms.

THE PHENOMENON OF TOLERANCE.

In the clinical use of addicting narcotics the degree of physical dependence parallels the development of tolerance and does not occur in its absence. Tolerance may be described as being the state arising when there is a gradual increase in the dosage of the drug necessary to produce the same effect as did the initial dose.

There are certain characteristics of tolerance and its development to morphine among which are: (1) The shortening of the duration of action following a given dose. This state is soon followed, if the dose is rapidly increased, by the disappearance of the narcotic effect of the drug, which include mental depression, weakness, anorexia, sleepiness and analgesia. Maximum tolerance development is marked by euphoria, narcosis, hypnosis, respiratory depression, peripheral vasodilatation. Partial tolerance development is marked by bradycardia, miosis, and gastric acidity. When no tolerance is developed a convulsant action, intestinal excitation and wheal formation occur.

The rate of disappearance of tolerance varies with the tissue affected and the ease with which tolerance is developed. In this case, blood vessels gain and lose a state of tolerance in a few hours, while the slowly developed tolerance to the emetic effect takes a correspondingly long time to disappear.

Mechanics Involved in the Development of Tolerance.

It has been shown by animal experiments that morphine and the synthetic analgesics combine with receptors located at two different sites on the same neuron: (1) on the surface of medullated axons of internuncial neurons; (2) in the cell body of the same or other neurones. The receptor-drug combination on the axon is a surface phenomenon and the pharmacologic response occurs only at the time of receptor occupation by the drug. The reaction that takes place here occurs rapidly with a rapid return of function when the drug is displaced. Receptor-drug combination in the cell body requires intracellular penetration, which is slow in onset and long lasting in action. The pharmacologic response to this drug-receptor interaction is cellular excitation which lasts throughout the whole period of receptor occupation with the drug, in this way differing from the action of the drug on the axon. Prolonged occupation of the receptor at this intracellular site causes cellular reactions which produce a state of excitability in the cell body which outlasts the presence of morphine in the cell. These reactions are apparently changes in biochemical composition of these cells. From these concepts, it is deduced that narcosis, analgesia and motor weakness result from partial blockade of axon conduction in internuncials in the brain and cord and tolerance to be a never complete, saturation of axon receptors.

It is also deduced that the abstinence syndrome is an unmasking of the state of increased excitability in the cell body of the neuron. Its appearance coincides with the loss of morphine from its receptor site on the axon thus permitting increases in axonal conduction.

CLINICAL CHARACTERISTICS OF ADDICTION.

Addiction to Morphine.

This has three characteristics:

(1) tolerance, (2) physical dependence, (3) emotional dependence.

Proper therapeutic administration of morphine seldom leads to addiction. It is more common among males in the third decade of life.

In the beginning of addiction, the drug is taken as either snuff (heroin) or subcutaneously (morphine). The intravenous route is eventually adopted as addiction proceeds.

The symptoms of morphine intoxication prior to the establishment of tolerance are nausea, vomiting, pallor, sweating and itching. The conjunctivae are reddened and eyelid blinking is less frequent. There is increased psychomotor activity which gives way to somnolence during which opium dreams and fantasies occur.

Intravenous use of morphine causes sudden dizziness, peripheral vasodilation and intense itching. Addicts compare the sensation to a sexual orgasm referred to the abdomen instead of the genitals.

As the addict becomes tolerant, the state of somnolence disappears, the pupils are constricted and constipation is present. The addict is able to carry on a highly skilled technical occupation. The only signs of addiction may be needle marks over the veins and constricted pupils. Libido decreases in both males and females. The length of intercourse necessary to obtain an orgasm is increased and women cease to menstruate and pregnancy is rare.

If morphine is withheld from an addict, the morphine abstinence syndrome results. In 12 hours, he begins to yawn, to have lacrimation, rhinorrhea and perspiration. He goes to sleep and in eight hours he awakes with much more severe yawning, rhinorrhea, lacrimation and perspiration. The pupils dilate and he complains of severe pains in the back and legs and of hot and cold flashes. After 36 hours, he becomes extremely hyperactive. He begins to vomit and have diarrhea. He cannot sleep and cannot eat.

The symptoms reach a peak 48 hours after the last dose of morphine is administered and remains intense until the seventy-second hour of abstinence. By 10 days, the objective signs of abstinence have disappeared although insomnia, restlessness, muscular aches and pains remain for weeks.

Among the synthetic analgesic addicting drugs should be mentioned Demerol. In the U.S.A. it has been called the "doctors' and nurses' addiction". The clinical picture of addiction to this drug is essentially the same as that for morphine.

Barbiturate Addiction.

Addiction to barbiturates is often a mixed intoxication, often with concomitant abuse of both alcohol and amphetamine. The addicts usually take the drug orally.

Intoxication resembles intoxication with alcohol. The symptoms include impairment of mental functioning, loss of emotional control, ataxia and nystagmus. Tolerance to barbituates is never complete so that acute poisoning may occur in an addict.

Abstinence symptoms follow withdrawal of barbituates. These decline during the first eight hours, but the addict then becomes nervous, has headache, muscular twitchings, weakness, and vomiting. These symptoms become progressively more intense at the end of 24 hours. About the forty-eighth hour of withdrawal, convulsions may occur, following which the patient may develop delirium. The delirium is characterized by tremors and hallucinations and ends in five days with a prolonged period of sleep. Patients usually recover even though no treatment is given.

Cocaine addiction is becoming rare. It is used in conjunction with heroin or morphine, and taken intravenously. It produces an ecstatic sensation of extreme mental and physical power. The effects last only a few minutes so that the dose is repeated at 10-minute intervals to recapture the tremendously pleasurable sensations. A characteristic paranoid toxic psychosis develops, during which the addict is dangerous.

Cocaine, Benzadrine and Marihuana Addiction.

Tolerance to cocaine does not develop and there are no true withdrawal symptoms.

Benzedrine and dexderine are used by addicts in combination with alcohol or barbiturates. Symptoms of intoxication resemble those of cocaine intoxication. Tolerance to these drugs does not develop nor are there withdrawal symptoms.

Marihuana consists of the dried leaves of the hemp plant. It is smoked in the form of cigarettes. A small amount of smoke in inhaled, and then a large amount of air to dilute the irritating smoke. A great feeling of elation results, there is giggling, singing and dancing. The breath has a characteristic odor and the appetite is enhanced. No tolerance is developed and there is no abstinence syndrome.

TREATMENT OF DRUG ADDICTION

The treatmen of drug addiction is primalily a psychiatric problem and attempts to carry out such therapy in the home or office will invariably fail. Institutional treatment is always required.

Heroine and Morphine.

The best method of withdrawing heroin or morphine from addicted patients is the substitution of methadone for whatever opiates or synthetic analgesic the patient has been using followed by the reduction of the dosage of methadone over a period of about 10 days.

The first decision which must be reached before withdrawal begins is the degree of dependence on narcotics. During the first two days in hospital, the dose of methadone should control all symptoms of abstinence, 5-40 mg. three times per day is usually sufficient. Reduction is started after two days by cutting the dosage by 50 percent.

While narcotics are being withdrawn all addicts require reassurance. No special dietary measures are necessary but anorexia is common. Hypnotics will be necessary for insomnia the first few nights.

Cocaine and Marihuana.

Since no physical dependence is produced by cocaine or marihuana, the withdrawal should be abrupt and no substitution therapy is necessary. Sedatives are necessary for insomnia.

Barbiturates.

Barbiturates should be withdrawn very slowly. Patients who show signs of barbiturate abstinence on admission such as weakness, nausea and tremor are in danger of developing convulsions or psychosis. Such pattients should be given nembutal at once.

After the patient has been observed for a day or two, reduction of barbituates can be started. The dosage should not be reduced more than 0.1 gm. daily. Patients being withdrawn from barbituates must be kept under close observation. Their beds should be provided with side boards so that if convulsions occur they will not fall to the floor. Patients should not attempt to walk and the diet should be light for the first ten days. Should convulsions or psychosis occur the treatment is reintoxication with barbiturates.

Following the withdrawal of opiates or barbiturates, rehabilitative and psychiatric treatments are instituted. The rehabilitative measures are only supportive. Pshchiatric treatment is necessary if any permanent success is to be expected.

PSYCHIATRIC ASPECTS OF DRUG ADDICTION

The majority of drug addicts have behaviour deviations or personality defects. They are either neurotics, psychopaths, psychotics or persons suffering from intractable pain. Neurotic persons seek relief from anxiety, psychopaths use drugs to create a state of elation, psychotics use such agents to relieve depressions, while normal persons use drugs to relieve pain. Most addicting drugs produce a physical dependence and this is viewed as a complicating process. With the development of physical dependence, the euphoric effects of such agents become more difficult to attain and the drugs are then used to prevent the distressing abstinence phenomena and also due to the fact that tolerance develops to the orgastic effects which are experienced from intravenous injection.

This process ultimately produces changes in the addict's behaviour that are disastrous for him. The original euphoric effects become more and more difficult to attain. Increasing amounts of opiates are needed. Eventually, the motivation to obtain sufficient supplies of the drug become paramount. Antisocial behaviour may be displayed when opiates are not obtainable. Large quantities of barbiturates or alcohol are substituted. Sooner or later the addict will be forced to seek treatment.

The use of addicting drugs to the point of physical dependence does not necessarily produce a life-long addict. Once satisfactory treatment has been carried out the patient may find either individually or through group therapy, ways of handling tensions and anxieties without resorting to drugs.

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