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Medical aspects in the treatment of alcoholism

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MEDICAL ASPml'S IN THE TREATM&NI' OF ALCOHOLISM

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INTRODUCTION

Alcohol intoxication can be considered the most common form of poisoning. Cases of acute and chronic intoxication exceed all the other cases of poisoning from all toxic agents combined. It has been estimated there are 70 million people in the United States who drink intoxicating beverages to some extent. Of this group, there are 4 to 5 million who drink excessively but still have their drinking under control and could stop without serious difficulties. There are an estimated additional 700,000 to 1 million addicted to alcohol. Approximately 12,000 die each year from chronic alcoholism, most of them between the ages of 30 and 55.

It is commonly thought that most addicted drinkers come from a skid-row environment. In work done by the Alcoholism Research Foundation in Toronto a few years ago, it was found that only 6.3% were from skid-row, while 60.9% came from the white collar group of professional men, business executives, skilled and semi-skilled workers. It becomes apparent that alcohol affects both men and women in all economic, intellectual and social levels. Alcoholism is a major mental health problem. These patients are really ill; emotional-ly, physically, and mentally. Rational, scientific investigation of the alcohol problem has not progressed satisfactorily because of moralistic attitudes, but the last few years have brought some change. Actually, no group of people are in greater need of con-sideration.

To approach the problems of this large group, some attempt should be made to classify them into smaller groups for the sake of convenience. A variety of methods has been used; a few of these will be mentioned in this paper.

Billings does not consider alcoholism a diagnosis but a form of behavior that is a manifestation or symptom of one or more of a wide variety of sociological, medical, and psychiatric disorders. He considers early detection very important. Almost any adult entering a general hospital should be suspected. He places alcoholics in three categories: (1) the acutely intoxicated person having 0.2% to 0.5% blood alcohol concentration; (2) the known chronic alcoholic, medically or surgically ill, (3) the unsuspected chronic alcoholic, usually with some concurrent medical or surgical condition.

Sampson includes alcoholism in the classification of psychosis:

1. Functional psychosis, a primary dysfunction of the mind.
2. An organic psychosis. Pathology is present, due to local disease or secondary to a disease.
3. Toxic psychosis, due to external toxic agents or toxic products of metabolism. This category would include alcoholism.

I do not favor this classification because it does not include the primary problem of addiction; only a small part of these alcoholics will show psychotic characteristics.

Montague has a different classification. (a) Primary alcoholics,

the problem of this group is addiction. After this is broken, their rehabilitation is relatively simple. (b) Secondary alcoholism; the addiction is secondary to feelings of insecurity, inferiority, frustration, etc. Cure of the addiction is only part of this problem; the psychiatric aspect must also be attacked. (c) Simple excessive drinkers. These are not alcoholics; they get drunk because they want to. This is not a disease, but a social problem.

Neihaus classifies the entire population as:

1. The abstainers.
2. The occasional social drinkers. They do not drink alcohol more than twice a week.
3. The regular daily drinkers, occasionally excessive, but their drinking is still controlled. These people may need some help, but only in the stages of acute intoxication.
4. The chronic, uncontrolled addicts. Without a doubt, this group needs the most help. Many of them will not admit their plight. Although they need assistance, it is difficult to treat them unless they personally express a desire to be helped.

I find this classification to be quite accurate and complete. Another classification by McGill considers groups 2, 3, and 4 as drinkers, drunks, and alcoholics respectively. His definition of an alcoholic is valuable: An excessive drinker of alcoholic beverages who has lost the power of self-control over the amount,

place, condition, company, cost, and consequences of his drinking; one who drinks in response to a pathological and uncontrollable urge.

The Alcoholism Subcommittee of the World Health Organization defines alcoholism as, "A chronic disease or a disorder of behavior, characterized by the repeated drinking of alcoholic beverages to an extent that exceeds customary dietary use or the ordinary compliance with the social drinking customs of the community, and that interferes with the drinker's health, interpersonal relationships, or economic functioning." (1)

In this paper, the major portion of my discussion will concern the medical treatment of the chronic alcoholic. In addition to the control of the withdrawal symptoms and various methods of curing the addiction, I will discuss the acute intoxication phase which may or may not involve the strictly chronic alcoholic. The psychotic stages, which the long-term alcoholic may experience, will be considered and their treatment proposed. Because of the voluminous amount of research and writing which has been done concerning alcoholism, this paper deals primarily with the medical aspect of the treatment. There is a short general discussion regarding the social and psychiatric aspects since they are generally considered to some degree, even without formal intent.

(1) McGill, R. E., Treatment of the Alcoholic in the General Hospital, Hosp. Mgmt., Vol. 83, No. 4, (April), 1957, p. 47.

I propose the thesis that a successful plan of therapy is available to the alcoholic who sincerely wishes to be cured from his addiction. This regime need not be directed by a specialist in any field, but can be successfully performed by any patient, conscientious, honest doctor of medicine.

GENERAL CONSIDERATIONS

Preparations for determining a plan of therapy for any major abnormality of a patient requires a thorough examination. Treatment of an alcoholic is no exception. There are so many abnormalities in the lives of these people that the usual physical examination is not adequate. Detailed neurological and laboratory tests should be done. There is often a sizable psychiatric problem. To evaluate this, a careful psychiatric work-up, including mental status and psychologicals, should be completed.

The families of these people are often affected. This is usually enough to require consideration; thus, a social history is valuable in learning more about the patient's family, work, economic status, and living conditions.

Treatment of a condition is usually directed at its cause. At present, psychiatry considers alcoholism as a symptom of some underlying personality disorder.

According to Giorgio Lolli, the primary physiological connotations of the alcoholic disposition are instability and a low stress tolerance. The living organism must be able to adjust to its constantly changing environment in order to lead a normal, efficient existence. The addict seems to show some instability in his biological processes, such as a wider than average fluctuation of blood pressure, blood sugar, and emptying time of the stomach. This variation may be related to the addict's limited ability to tolerate

physical and mental pain. When stimuli arise, almost impulsive searching for satisfaction is initiated and must be fulfilled to prevent unbearable tension.

The psychological abnormalities of the alcohol addict's personality are somewhat more obvious. From infancy, a normal proportion of pleasurable and painful experiences result in a satisfactory adult adjustment. If excesses of either experience occurred to a significant amount, the development of the personality may not progress beyond the period of excesses. In the case of pleasure, one may not want to release what was so pleasant; in the case of pain, a fixation may originate as a means of obtaining that satisfaction which was never experienced. He may regress to react to stress or stimuli much the same way as he had previously. Thus, the addict is very impulsive in satisfying his instinctual drives, in much the same manner as an infant does.

In most addicts, childhood difficulties may be uncovered through detailed investigation. Although many of these lead normal adult lives, excessive use of alcohol satisfies abnormal and urgent needs, even though only briefly and inadequately.

Briefly, psychiatric treatment is of two types: (1) individual psychotherapy which may be supportive or analytical. It usually approaches the drinking problem per se. The patient is given the chance to transfer some of his dependence from alcohol to the therapist. The therapist gradually allows the patient to assume his personal

responsibilities at a pace he can tolerate; (2) Group psychotherapy where the patient gradually and realistically accumulates responsibility and self-confidence when he associates with people who have similar problems. Alcoholics Anonymous uses this very effectively with many patients. Psychotherapy does not necessarily need to be formal; as a matter of fact, it may begin as soon as the patient tells his physician of his condition and his sincere intent to abstain.

Good rapport is vital. The patient must feel that the therapist is sincere and without lack of faith in him. Communication must be at a mature level with the patient of the belief that only his potentially mature element is being dealt with.

Most alcoholics, at some period, wish to quit drinking but do not know how. Most wish to drink normally. One of the first steps is to eliminate the thought that any drinking is possible. For this particular patient, any alcohol is abnormal. The patient must know he is expected to assume responsibility and that abstinence is primarily his responsibility, with the assistance of the doctor. Legal commitment is of questionable value as the patient is subjected to too much authority and not enough individual responsibility is required of him.

The patient will have difficulties with his family and friends. He is urged to be frank and truthful. This may be difficult at first, but, after intelligent and unrestrained discussion, he will gain self

respect and confidence. Patients should be warned about skepticism on the part of their families, especially if they have tried to quit drinking in the past. It will be difficult for the marriage partner to adjust to the new role of not expecting emergency phone calls, drinking disasters, and rages of inebriety. The family has been protective for years. No rapid change can be expected. The patient must not be treated as a child; it is inconsistent to also threaten him as if he were a child. Very often the marriage partner, parents, or other members of the family need counselling to allow the patient to assume his rightful place and responsibility. It is sometimes advisable to have the patient away from the home environment for awhile.

The patient should be taught to relax. This, if practiced, will relieve some of the tension so often seen in alcoholics. It will indicate to the patient that he does not need to drink to allay his tensions, anxiety, and inner conflicts.

Treatment depends a great deal on the patient's own wishes. Hospitalization of the patient to get him off alcohol is very necessary. This should be of short duration, if possible, since he must be taught to live in an environment where alcohol is available and he is to abstain from its use.

McGill recommends keeping these patients in a general hospital and treating them as any other sick person since the alcoholic is quick to sense discrimination. The fear of stigma is very real. 10% of alcoholics accepted for treatment will require prolonged

treatment and hospitalization with special care because of personality defects or deep-seated psychotic backgrounds. These are best referred to a mental institution where they can receive more appropriate care.

The Council on Mental Health of The American Medical Association has urged hospital staffs and administrators to consider admission of the alcoholic to a general hospital for treatment in those instances when the patient requests admission and is cooperative. Of course, the physician's opinion and attitude concerning the capabilities of the particular hospital personnel for this type of treatment is an important consideration.

The American Medical Association has published these opinions on the handling of alcoholic cases: (1) the scope of medical practice does include alcoholic symptomatology and the complications which occur in many personality disorders, (2) acute alcoholic intoxication can be a medical emergency and should be judged so on the merits of the particular case, (3) whether or not an alcoholic patient is to be admitted to a hospital should be based on the merits of the individual case as determined by the attending and admitting physicians, (4) house staffs should accept these patients for treatment for the benefit of the staff as a part of their own training in handling this type of patient, and (5) the individual patient should be evaluated regarding his problem, rather than putting him in a general classification of "alcoholic."

The general hospital is in an excellent position to assist the community in education in the treatment of alcoholism by accepting these patients, assisting in research, case findings, and follow-up.

ACUTE ALCOHOLISM

The phase of acute alcoholism includes the various degrees of acute intoxication. This may involve a person who has imbibed for the first time but to sufficient excess to require medical attention in order to be more comfortable or even to survive. It may also include the acute intoxication of the chronic alcoholic who has not yet progressed to the various levels of delirium tremens. In this chapter I will also deal with the immediate withdrawal period after a drunken episode. Delirium tremens usually occur in the addicted chronic alcoholic and will be discussed in a later chapter. In the acute alcoholic, one may see early intoxication when the patient is hyperactive, elated, and excited, or any degree through the confused and stuporous states to the severely deep coma.

Different therapy is needed for these extremes, but by knowing the general intention of the therapist, one is able to make appropriate adjustments to the case at hand. Because of the seriousness of the comatous patient, I will discuss the more severe conditions first.

Patients seen in the hospital in an alcoholic coma are by no means rare as indicated in a report by Solomon and Aring in 1938. Of 1167 admissions in coma to Boston City Hospital, 59.1% were diagnosed as being in an alcoholic coma. Mortality of this group was 2%. It was conceded by the authors, however, that this was from an area of excessive alcoholism. A Cook County series by Holcomb, in which only deaths after coma were reported, showed in

a group of 342 deaths, 16 had been in an alcoholic coma, giving a mortality of 4.6%.

It is thought that a very narrow margin of safety exists between acute intoxication and alcoholic coma. Many patients are severely intoxicated when the blood levels reach 450 mg%. Although some deaths have occurred between levels of 350 - 475 mg%, most deaths occur when the blood levels range between 550 and 900 mg%. This concentration is uniformly fatal if untreated.

When the patients are first seen, one should note the vital signs as a means of early detection of respiratory distress, shock, and trauma. It can be seen from the Boston City Hospital report that a problem of differential diagnosis of coma could easily exist. At the time the vital signs are being observed, one should also begin differentiating the causes of coma. The history is all-important but it is often the case that none is available. An alcoholic coma is usually not deep and is of short duration. One sees a low blood pressure, increased heart rate, and, ordinarily, hypothermia. The breath odor may indicate alcohol; there is hyperemia of the face, conjunctivae, and telangiectasia. There are no focal or lateralizing neurological signs nor alteration of the cellular count of the cerebral spinal fluid. There is no indication of meningeal irritation.

It is well to determine the level of coma by painful and verbal stimuli and reflex response. One must remember the frequency of

other conditions that exist with alcoholism, especially in coma. It may be difficult to differentiate the precipitating factors. Infection is often seen because of the generally poor nutrition of the patient. However, one would expect hyperthermia and a more rapid respiration rate in this case. There may be an existing head injury sufficient to cause coma.

If alcohol is apparent on the breath, differential diagnosis is important and would be based on localizing or lateralizing neurological signs to rule out traumatic etiology of the coma. In a known alcoholic, there is a possibility of hepatic coma, although in this case one would be likely to find ascites, jaundice, flapping movements of the outstretched arms, and a musty breath. The other causes of coma are generally ruled out without significant difficulty.

In treatment of apparent respiratory distress, one should be prepared to provide suction. An endotrachial tube can be inserted rather easily if the reflexes are generally depressed. This would ordinarily provide adequate airway. Oxygen may be started, either by nasal cathater or tent. Some therapists advocate the use of carbon dioxide concurrently or intermittently to stimulate respiration. The patient should be placed in a semi-prone position with the head low to prevent aspiration of vomitus or secretions into the respiratory tree. Artificial respiration may be needed if the preceding methods are not successful. Nikethamide (Coramine),

5 cc intravenously, is recommended by Rosenbaum to increase respiration. Other analeptics, such as Pentylenetetrozol (Metrazol), 6 to 7 cc intravenously, strychnine sulfate, 15 to 20 mg intravenously, and benzedrine, 20 mg intravenously, have been recommended and used by various authors with some success, although in series too small to be conclusive.

If significant shock is evident by cold, clammy skin and a drop in blood pressure, fluids should be initiated immediately. Since these patients are ordinarily dehydrated, the readily available electrolyte or dextrose solutions may be started. Whole blood or plasma expanders should be used as soon as possible if there is evidence of blood loss. Vasopressor drugs may be used, if necessary, but usually are not indicated unless the shock is severe or due to vasodilatation.

Gastric lavage can generally be done without difficulty and may be very beneficial by removing any products of gastritis and unabsorbed alcohol. Analysis of the contents may be helpful in final diagnosis. The urinary bladder should be drained to relieve pressure and also furnish urine for additional analysis of alcoholic content. According to the report by Jetter in 1938, there is a definite correlation and similarity in the alcoholic concentration in the blood and urine. Prophylactic antibiotics may be started with careful observation to detect any early sensitivity manifestation. If the patient is comatous for over 12 hours, Rosenbaum

recommends that a spinal fluid specimen be obtained to rule out other undetected central nervous system abnormalities since alcoholic coma does not ordinarily remain this prolonged. During the course of this coma, the blood pressure, pulse, respiration, and temperature should be taken and recorded every 30 minutes.

Intake and output should be accurately recorded. Parenteral fluids with increased vitamin supplements, especially B and C, should be maintained as necessary. According to the patient's condition, total daily fluid intakes should be 3 - 4 liters. After the patient begins to respond fairly well and is able to take fluids orally, it is suggested that a sippy diet be ordered and followed by bland and regular diets as tolerated. Until the patient is very responsive and begins to show withdrawal symptoms, it is recommended that additional therapy be kept at a minimum since sedatives prolong the convalescence from coma. Control of withdrawal symptoms, which may arise at this point, is the same as that described in the following section on the excitement phase of intoxication.

Those patients in the excitement phase, when requiring medical attention, usually are suffering from gastrointestinal upset, such as nausea and vomiting (dry heaves) hematemisis, belching, epigastric distress, abdominal distention, and other signs and symptoms of gastritis. These patients are often hyperactive, somewhat disoriented, and confused. There may be severe abdominal pain with rigidity which is considered by some to be a "surgical abdomen." Cases have

been reported, following surgery, in which pancreatitis has been found. Autopsy on other cases has revealed hemorrhagic necrosis of the pancreas. This has been thought to be due to excessive stim-ulation of the pancreas and release of enzymes.

After the withdrawal of alcohol in these cases, one may use gastric lavage and fluids as described previously. Some authors advocate the use of insulin or insulin and glucose to increase the rate of oxidation of alcohol. Doses as high as 25 units of regu-lar insulin t.i.d., with 2½ grams of dextrose in fruit juice for each unit of insulin given, may be administered. Rosenbaum men-tions the use of the "Bellevue Cocktail" which has been found to be beneficial in acute alcoholism and delirium tremens. This sol-ution contains 50 cc 50% glucose, 10 units regular insulin, 200 mg nicotinic acid, 100 mg thiamine, 2 cc Plexbes, 100 mg ascorbic acid, and 100 mg pantothenic acid. This is to be given intravenously and may be repeated 1 - 2 times.

A large variety of sedatives have been recommended to relieve the withdrawal symptoms, as well as reduce the signs and symptoms of the excitement phase of acute intoxication. Paraldehyde has been one of the most popular sedatives, and has been recommended by Rosenbaum to be administered 15 cc orally every 3 hours. It may also be given 1 - 2 cc intravenously, 16 cc intramuscularly, or 30 - 40 cc by rectum. It is quite effective in relieving with-drawal symptoms; however, it has the disadvantage of causing an

habituation.

Chlorpromazine has been fairly effective. It is given 100 mg orally. This dose may be repeated in 6 hours with 25 - 50 mg every 6 hours. It may be given parenterally 50 mg initially, then 25 mg every 6 hours for maintenance. This should not be given while the patient is in a stupor or coma.

Promazine has been recommended with 25 - 100 mg every 4 - 6 hours. Mitchell reports the use of promazine (Sparine) in 141 acute intoxicated hospitalized patients. 98 of these patients had complications, including cirrhosis, gastritis, barbiturate habituation, coronary artery disease, and psychoneuroses. In addition to promazine, he administered vitamins. Intravenous fluids were needed in only 2 patients who could not retain oral fluids. Nausea and vomiting stopped in 89% of the cases. The psychomotor agitation was well controlled in most patients. General withdrawal symptoms were controlled in all patients who stayed in the hospital 3 - 5 days. 23 patients with anxiety and depression had only partial relief of these symptoms. In this series, the only side effects experienced were mild dizziness and postural hypotension. The author recommends the drug be used with caution in older patients with cerebral vascular disease.

There have been several recent reports on the use of reserpine (Serpasil). In a series of 35 acutely ill alcoholic patients (this was used by Grandon et al.), the drug was administered initially

intramuscularly, followed by oral intake as soon as possible. It was observed that there was diminished psychomotor activity without impairment of consciousness. Delirium tremens were aborted in two cases. Some patients reported a lessening of compulsion to drink; in some other patients, an improvement to drinking moderately. There were no serious side effects; however, some flushing of the skin, conjunctival injection, dizziness, and gastrointestinal discomfort existed to a mild degree.

Greenfield reported the use of reserpine in a series of 110 private patients. These patients had symptoms including the stuporous state, "jitters," early delirium tremens, anxiety, depression, and guilt. 87 of these patients were treated as out-patients, 23 were hospitalized because of reasons other than the severity of the alcoholism (such as secondary diagnosis, otherwise inadequate care, and the availability of hospitalization plans).

Standard routine included 1 cc or 2.5 mg intramuscularly initially, then Serpasil 0.25 mg and 5 mg of Antrenyl orally 4 times daily. The Antrenyl was used because most of the patients had some degree of gastritis. Vitamins, particularly thiamine, were given parenterally. The patients were started on a sippy diet for the best nutritional regime. Additional 1 cc doses of Serpasil were given on following days if the patient needed it. By the fourth day, only 3 out-patients and 1 hospitalized patient needed parenteral Serpasil. 87% of the hospitalized patients, and 73.6%

of the out-patients, were in very good control within 24 hours. The remaining hospitalized patients, and 11.5% of the out-patients, showed marked improvement in 48 hours. The remaining out-patients showed little or no improvement within 60 hours. There were no serious side effects of any significance. Some flushing and nasal stuffiness was present.

The author had no hesitancy in using this drug on out-patients. Several of these were hypertensive. Their blood pressure was reduced to more normal levels without complications. The generally common symptoms of palpitation and arrhythmias were improved to a more normal status by the cardiac slowing ability of reserpine. The use of this drug prevented any drug addiction problem. In this series it was chiefly used on out-patients. The withdrawal symptoms were more than satisfactorily handled without excessive sedation. The patients were able to feed themselves and required less nursing care and parenteral therapy.

Billings also recommended the use of 0.1 grams of Dilantin 2 - 3 times daily for 3 - 5 days to protect the patient against convulsions. Phenobarbital and chloral hydrate have both been used to relieve withdrawal symptomatology but have the disadvantage of causing habituation if given for a long duration. Thimann reports the use of meprobamate on 65 alcoholic patients and 6 addicts for the acute and subacute stage of alcohol withdrawal. He used placeboes in a control group of 25 alcoholics. These patients

also received insulin in dextrose and sedatives such as paraldehyde or chloral hydrate. The meprobamate was continued for 1 - 2 weeks in 40 of the patients. This drug was continued for several weeks on the remaining 25 patients to relieve prolonged tension and insomnia. Of the 65 patients, 5 showed marked relief from discomforts, 33 received moderate reduction of withdrawal symptoms, and the remainder showed mild or no improvement. Of the 25 alcoholic patients receiving placeboes, only 5 showed mild improvement. There was no improvement in the remaining 20. Meprobamate seems to be most effective in the subacute stage of alcoholic withdrawal or the acute phase of mild intoxication. It is safe, quick-acting, and efficient. No side effects were observed in this series.

ACTH and adrenal cortical hormones seem to be of questionable value other than in the acute intoxication of chronic alcoholics. Adrenal cortical extract is more effective as a sedative than ACTH in the female alcoholic. Billings suggests the use of ACTH 20 - 40 units twice a day for a couple of days. It is thought by some that adrenal insufficiency exists in chronic alcoholics. It is the opinion of Koppanyi that there is no deficiency of adrenal cortex or pituitary. He believes ACTH and ACE act only as sedatives and do not increase the rate of ethyl alcohol metabolism or its excretion.

Thimann suggests two other drugs. These have the advantage of being non-sedative in nature, thus eliminating further chance of

habituation. Bellafoline, 0.75 - 2 mg per day, is given as a vagal depressant. A sympathetic depressant, ergotamine (Cynergen) 3 - 8 mg, is given daily. He has found when these are given for a period of 1 - 3 days the patients are calmer, more relaxed, have less anxiety, and require less use of habit-forming drugs.

As one continues to read the literature on the treatment of acute alcoholism, it becomes readily apparent that tremendous numbers of medications have been used with varying degrees of success. Not all the success can be attributed to the medication but is a result of a composite of considerations by the hospital staff, nurses, patient's family, and the patient himself. The number of variables of these different aspects will affect the final prognosis. It is for this reason that each therapist must devise his own methods of therapy which can be adjusted to the patient and his environment to produce the best results.

CHRONIC ALCOHOLISM
(The Ambulatory Patient)

The treatment of this category of alcoholism is probably the most difficult. Results can be very frustrating to the therapist, although a successful regime is most rewarding. Therapy is usually extended over a long period of time. Accurate observation of the patient is necessary up to from 12 to 18 months on an aver-age. Analysis of the patient over this long period is necessary for further evaluation of his capabilities and sincerity in at-tempting to remove this thre t to happiness.

A physician will be consulted by numerous members of the community in an attempt to cure one alcoholic. Patients come to the doctor by request of their ministers, attorneys, or various members of their family. The alcoholic patient may make an appointment, only as a means of satisfying these forces. He, himself, may not have enough self-confidence or self-respect, or even the willingness to attempt a cure of his addiction.

The patient may think he can learn to drink moderately. It is the consensus of opinion that a person addicted to alcohol must be completely abstinent as the first step in attempting to cure his addiction. He must have a sincere desire to become cured. This attitude must usually arise as a result of great personal loss, either physical or social. The patient must realize it is impossible for him to ever again drink moderately; complete abstinence is mandatory. This thought should be given the patient

as his prime responsibility.

A wide variety of drugs have been tried and used by the chronic alcoholic. The ataractic drugs generally decrease or relieve anxiety, hyper-irritability, tremors, and other tension states, and are most effective in the management of the withdrawal and immediate post-withdrawal period. Meprobamate (Equanil or Miltown) has its greatest tranquilizing effect apparently in its control of recurrent anxiety upon entering abstinence. Since this anxiety is often the cause of a relapse to drinking, this drug is effective in lengthening the abstinence period by its action. Side effects are generally insignificant. Dosages range from 400 - 2400 mg per day in divided doses without danger. Actual amounts should be individualized.

Mephenesin, when combined with carbomate, is known as Tolseram and gives long effective blood levels. Mephate is its combination with glutamic acid for more efficient gastrointestinal absorption. The effect of this drug is quite favorable although its greatest action seems to be in inhibiting the gross tremors in the withdrawal phase. It is primarily a muscle relaxant which exerts an inhibitory effect on the internuncial system of the brain and spinal cord. Initial doses, during acute symptoms, should be 1 - 3 grams of mephenesin or Tolseram and 0.5 grams of Mephate several times a day. The dosage should be adjusted as the symptoms decrease, and according to the response of the particular patient.

The long-term therapy results with this drug have not been adequately analyzed.

Chlorpromazine (Thorazine) is another tranquilizing agent especially effective in controlling the patient with withdrawal symptoms. It is an adequate depressant of the psychomotor hyperactivity. It is effective in reducing nausea, vomiting, and the retching so often seen. Dosages of 75 - 100 mg are usually effective, but must be adjusted according to the needs of the particular patient with special reference to his psychomotor hyperactivity. Dosages are greatly reduced during the course of 4 - 7 days. This drug reduces the need of other sedation; the patients are usually relaxed and cooperative. Side effects include postural hypotension in some patients. Liver disease does not appear to be a contraindication for the short duration of treatment necessary.

Fox reports good results in a group of 33 patients who received on an average of 13 doses of meprobamate (400 - 800 mg per dose) and 1 - 2 doses (10 - 25 mg) of chlorpromazine or 10 large doses of chlorpromazine. No alcohol was needed for these patients. They were hospitalized an average of 3 days with no side effects. The patients seemed to be adjusted and amenable to psychotherapy.

Promazine (Sparine) is somewhat more effective than chlorpromazine in controlling the symptoms in the withdrawal phase and psychomotor hyperactivity. This dose is 25 - 100 mg initially and is repeated every 4 - 6 hours as necessary. It can safely be

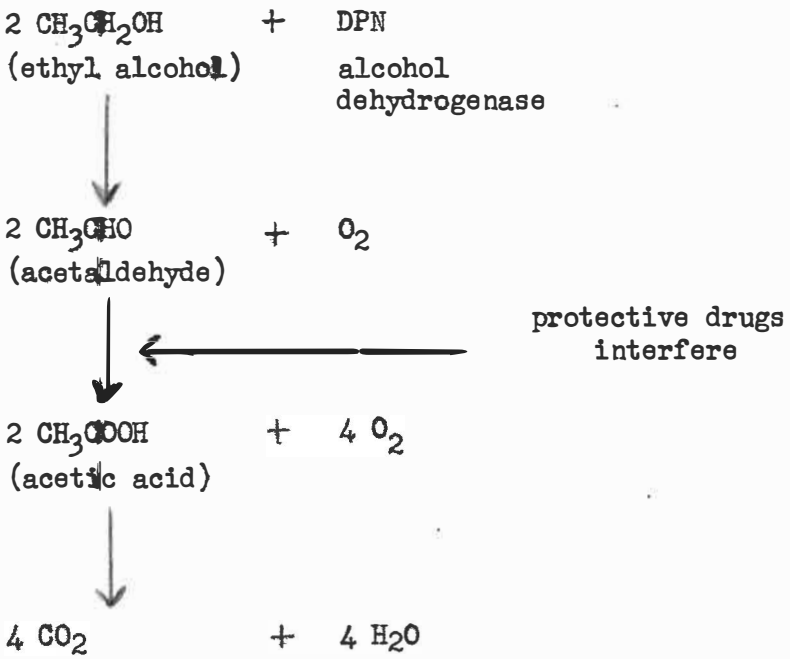
administered parenterally. Reports of side effects indicate less hypotension and gastrointestinal symptoms.

Rauwolfia Serpentina (reserpine, Serpasil) has been tried repeatedly in acute and chronic phases. Its greatest success has been found in control of mild anxiety during the abstinent period. It may also be considered in patients that do not tolerate the more effective tranquillizers. Ritter reported on a series of 180 alcoholics during a one year period. 39 of these patients were treated with reserpine, 0.25 mg 4 times daily. 36 patients were used as controls and treated with placeboes. Patients were seen weekly and given their supply of medication. No attempt was made to use formal psychotherapy. Only 75 patients attended the clinic 8 weeks or longer. A substantial number of both groups (taking reserpine or placeboes) seemed to improve by stopping drinking entirely or drinking less. There was no significant difference in these two groups, however.

The author commented on the fact that the patients were seen weekly and some personal interest was taken in their condition, in addition to some form of oral medication. It seemed to help the patient cut down on his drinking. Kline has made the comment that reserpine seemed useful during the period after withdrawal when delirium tremens would be most likely to occur. However, there is no evidence that it will prevent return to the addiction without the aid of other types of management.

Drugs in long-term therapy, known as the protective drugs have been used in the last few years with some success. The first of these to be described is tetra-ethyl-thiuram-disulfide. This is also known as Disulfiram, Antabuse, or TETD. This drug is used for the patient who sincerely wants to stop drinking, but, for other reasons, can not maintain abstinence. General action of this drug seems to be that of interference with conversion of acetaldehyde to acetic acid as shown in the following diagram.

Action(2)



This slowing of the second stage causes an increase of acetaldehyde 5 - 10 times the usual amount in alcoholic breakdown. The patient is given this drug daily for several days, then may be given

(2) Armstrong, J. D., The Protective Drugs in the Treatment of Alcoholism, Can. M. A. J., 72:228, (Aug. 1) 1957.

a test dose with alcohol, 1 - 2 ounces. This causes considerable flushing, headache, increased heart rate, palpitation, dyspnea, sensation of chest constriction, and possibly loss of consciousness. This test dose method is optional and has debatable value. It is thought that showing the patient the kind of reaction one would expect in taking alcohol after being on the drug should result in his being very reluctant to consume any alcohol.

Since it requires 3 - 7 days before the patient is able to tolerate alcohol after stopping the drug, it is thought the time interval would be sufficient to allow the patient to relieve the anxiety with more acceptable methods. The method seems to have debatable merit because several deaths have occurred due to alcohol test doses. Side effects include fatigue, drowsiness, metallic odor or taste, skin rashes, impotence, gastric irritation, and arthralgia.

Armstrong suggests the patient should receive 0.5 - 0.25 grams per day. Feldman believes many of the side effects may be eliminated by altering the doses. He has found the primary contraindication for the use of this drug is psychosis. It is the most significant toxic effect in some patients and clears up in about two to three weeks after discontinuance of the Disulfiram. He has found, contrary to earlier beliefs, that liver disease, thyrotoxicosis, diabetes mellitus, epilepsy, and cardiovascular disease are not contraindications if there is a true need for

this drug.

J. A. Smith et al. have reported on treatment of 24 cases treated with Antabuse, all of whom had failed on one or more other types of treatment. Dosages ranged from 150 mg to 1 gram daily. No sedatives, vitamins, or formal psychotherapy were given these patients. 15 patients abstained from 3 to 12 months; 4 others had one relapse, then returned for treatment. 5 have returned to the previous drinking patterns. Some of these patients were given Antabuse-alcohol reactions. There was no significant correlation between those successfully treated and those receiv-ing the alcohol reaction. Other severe conditions were observed in these patients. These involved a drop of blood pressure, pulse change, nausea, vomiting, and shortness of breath. This was thought to be an effective drug but its use must be carefully con-trolled because of unpredictability of the alcohol reaction.

Hayman and Wilkins have reported 7 cases of polyneuropathy due to alcohol-Disulfiram reaction. 6 were most likely due to chronic intoxication with 1 an allergic phenomena to the Disul-firam-alcohol test. This polyneuropathy developed gradually over 4 to 10 months of medication. It was suggested that Disulfiram be discontinued and cortisone and vitamins be administered to these patients. It is also recommended that the patient be thoroughly questioned for polyneuropathy before prescribing Antabuse.

The other protective-type drug which has been used more recently

is citrated calcium carbimide, also known as CCC and Temposil. Armstrong and Kerr have reported a comparison of two groups. 19 patients were given citrated calcium carbimide in dosages ranging from 50 - 100 mg per day for a duration of 6 days to 4 months. Several of these patients had experienced unpleasant side effects from Disulfiram. On CCC these side effects of drowsiness, nausea, impotence, and unpleasant taste were generally decreased or absent. A group of 33 patients were given Disulfiram dosages ranging from 250 - 500 mg daily over the same period of time. Only 17 of the 33 patients returned for follow-up. 11 of these had their dosages reduced because of drowsiness.

As a result of these tests, one gets the impression that fewer side effects occurred with the administration of citrated calcium carbimide. According to these authors, there seems to be a definite place for the use of CCC as a substitute for Disulfiram. However, they are also willing to acknowledge that further study is necessary. 73 male alcoholics committed to mental institutions were tested with Temposil by J. A. Smith and others. A total of 154 Temposil-alcohol reactions were observed. Typical response began in 5 - 10 minutes after the alcohol was given. There was injection of the conjunctiva, flushing of the face, headache, and dyspnea. Some became apprehensive, experienced cardiac palpitation, tremor, vertigo, and drowsiness, although generally less than with

Disulfiram. In only 4 reactions was there nausea and vomiting. Significantly less acetaldehyde shocks occurred; the usual fall in blood pressure seen in Disulfiram-alcohol reaction was reduced. In only 3 reactions of 154 was there a diastolic decrease of over 50 mm Hg from previous reporting. No systolic pressure was below 90 mm Hg. There was no evidence of orthostatic hypotension during these reactions.

An antihistamine was given intravenously at the peak of 9 reactions. In all cases there was relief obtained from dyspnea, chest tightness, and pruritis. There was decrease in cutaneous flushing, nasal congestion, and headache. The only side effect of significance was the mild leucocytosis on several patients during the second and third weeks of treatment.

An average daily dose of 50 mg was adequate in most of the patients. In only a few was this increased to 100 mg for greater effectiveness. This group of patients was sensitized to alcohol within 1 hour after taking Temposil. The material is usually excreted or inactivated within 12 - 24 hours. The Temposil-alcohol reaction occurs within 5 - 10 minutes after administration of the alcohol and lasts for a duration of 60 - 90 minutes. It was concluded from this series that Temposil needs to be taken daily. It is relatively safe to administer because of the few cardiovascular system symptoms which occur during the Temposil-alcohol reaction. It appears that this drug has considerable promise in assisting abstinence.

COMPARISON OF CCC & TETD

	CCC	TETD
Sensitivity	Matter of hours.	7 - 10 days.
Discontinuing	No reaction after 3 days.	Up to 14 days (Delayed reaction can be dangerous because large amounts of alcohol may be taken after discontinuing.)
Reaction failure	Impression of a greater number of failure reactions with this drug. However, this is not a large enough group to interfere with usefulness.	
Side effects	Few.	Numerous, including increased drowsiness.
Toxicity	No deaths. Possible increase in white blood cells, otherwise asymptomatic.	Some deaths. (17/11000 in Denmark at one time. 4 due directly to reaction, 13 secondary to disease.)
	29 patients went 3 - 9 months without signs and symptoms.	
	No psychoses.	Some cases where patient's personality had some tendency in that direction.
	Less stable than TETD. Should be kept from light or rough usage.	
Contraindication		Severe previous cardiovascular damage.

From this summary by Armstrong, it would appear that CCC would be a drug of choice in cases where Disulfiram causes severe reactions. The patient's personality type is important whether he needs the protection of a mild or severe reaction to continue abstinence.

Hormones have had some use in treatment of chronic alcoholism as physiologic agents. This has been based on at least 3 theories: (1) Chronic alcoholism has been thought to be a clinical expression of an existing state of hypoadrenalism; (2) benefits from cortical steroids are thought to be due to their effect on the stress phenomena resulting from chronic alcoholism; and (3) adrenal exhaus-tion is a result of repeated stimuli of alcohol intoxication. ACTH is needed to stimulate the adrenal.

In treatment, benefit is obtained, especially in controlling symptoms, shortening the duration of disability, and reducing the incidence of delirium tremens. The material used has been primar-ily ACTH, cortical steroids, and whole cortical extracts. They have been generally used in only the acute state and in amounts similar to that used in other medical problems.

J. J. Smith, 1950, who believes chronic alcoholics suffer from a state of adrenal exhaustion, has used ACE and ACTH and obtained improvement in some chronic alcoholic patients in acute intoxica-tion. Although he admitted ACE was somewhat more effective in the acute phase because of its sedating ability, he has found ACTH

more effective in delirium tremens in which improvement is seen within a few hours.

Lovell and Tinters, in Podolsky's book on addiction management, 1955, considered adrenal cortical extracts as the safest and most useful medical adjunct in treatment of alcoholism. They suggest, for the hospitalized patient in the withdrawal period, 10 cc of aqueous ACE intravenously 3 times in the first 24 hours, 2 doses in the second 24 hours, and single daily doses for 3 - 4 days. These doses may be doubled in severe or acute cases. Benadryl preparation, 2 - 5 cc with 10 cc ACE, may be given intravenously during an excitable stage to reduce gastrointestinal symptoms, anxiety, insomnia, and anorexia. After discharge the person may be treated as an outpatient. ACE, 5 cc intramuscularly twice a week, is given for 4 weeks and then weekly for longer periods.
If the patients have been abstaining for some time, they may be experiencing hypoglycemia, tension, apathy, or mental concentration difficulty. It is recommended that these patients receive 10 cc ACE intravenously for 4 - 5 days, then 5 cc intramuscularly twice a week for several weeks, and 5 cc intramuscularly weekly after that for a similar period.

Voegtlin used ACTH and adrenal steroids in an alternating manner with 39 patients over a period of 18 months. He concluded all patients were subjectively improved but not uniformly in amount and direction. 40% remained abstinent up to 12 months, but only

18% remained abstinent for 18 months. Less than 20% were definitely improved. His laboratory studies failed to reveal any consistent adrenal abnormalities in chronic alcoholics. He believes adrenal therapy may be useful as an adjunct to other therapy but of little benefit by itself. In the last few years, ACTH and ACE have been replaced by ataractic drugs in alcoholism therapy. These are generally less dangerous, less expensive, and provide fewer possibilities of abnormal physiological disturbances.

Another physiological agent, vitamins, has been found to be beneficial in therapy. This is based on 2 theories: (1) the fact that most alcoholics have a deficient diet, (2) the Genetotrophic theory that alcoholism is an hereditary metabolic disease. Williams believes that an hereditary trait requiring an excess amount of certain food exists. If the required amount of food is not consumed, then a craving for alcohol may exist. This specific deficiency is, as yet, not known.

In rat experiments, he has shown correlation in development of dependence on alcohol after a deficient diet, then removal of this dependence by supplying an adequate diet. Williams has had some success in treating alcoholics. Several patients have progressed to the point that they can control their compulsion and drink moderately. He prescribed specific capsules, each containing 15 items as follows:

Thiamine	3.3 mg	Riboflavin	2.67 mg
Nicotinamide	10 mg	calcium pantothenate	10 mg
Pyridoxin	3.3 mg	Biolin	0.05 mg
Folic acid	1.1 mg	p-Aminobenzoic acid	11 mg
Inositol	53 mg	choline	53 mg
Vitamin B_{12}	5 mg	Vitamin A	6667 units
Vitamin C	33.3 mg	a-Ticopherol	6.67 mg
Viosterol	333 units		

Feldman maintains that no nutritional therapy by itself has been able to alter the drinking pattern of acute chronic alcoholics. He acknowledges the need for the various components of the B complex vitamins in neuropathy, alcoholic encephalopathy, and Wernicke's syndrome. Krebs and Johnson reported the use of pangamic acid (vitamin B_{15}) in alcoholism. This facilitates the oxidation of alcohol in the liver and brain. The alcohol is metabolized more rapidly, tissue damage is less, and the deleterious effects of alcohol subsequently taken will be reduced. Pangamic acid used as a dietary supplement has provided the basis for early reports of reduction of acute alcoholism and chronic relapses.

The sedatives are not well accepted in the therapy for chronic alcoholics because of the danger of habituation. They have been used periodically to insure a good night's sleep when the ataractic drugs were not sufficiently effective. Metaphenylbarbituric acid (Mebaral) was used in a series of 41 chronic alcoholics by J. A.

Smith and W. T. Brown. All patients who took the medication in the prescribed manner remained abstinent during the period of treatment. 15 remained abstinent from 2 weeks to 5 months; 16 were abstinent from 2 to 4 weeks in preparation for Antabuse therapy. Although the course of treatment was short, it was effective in reducing tension, irritability, and insomnia without causing excess drowsiness or euphoria. It was found effective in the withdrawal phase and in aiding preparation of the patient for other therapy.

Paraldehyde is used some in the chronic alcoholic but usually only as the last means of managing the severely disturbed patient. It has been replaced by the ataractic drugs to prevent development of dependency.

The conditioned reflex, or aversion treatment, has been used with moderate success by some physicians. A series of 4468 were reported in 1950 by Lemere and Voegtlin in which the emetine aversion treatment was used. 44% of this group remained abstinent after their initial treatment; 878 of the remaining patients returned for treatment after a relapse. Of this group, 39% remained abstinent. A total of 51% of the complete group thus remained abstinent over a 13 year period.

Dent claims success with apomorphine. He suggests giving the drug hourly to patients in increasing hourly doses until vomiting occurs. Three-fourths of the emetic dose is then given every 2 hours until the next day. A full dose on the next day is gradually

increased every hour until vomiting occurs. Three-fourths of the new emetic dose is given every 3 hours thereafter. Food and drink are allowed; however, no alcohol is permitted. He reports the alcohol craving will soon disappear.

Pruitt has used laevulose, sub-emetic doses of apomorphine, and oxygen with success in arresting alcohol addiction. He suggests hospitalization for 3 - 4 days. His patients receive 1000 cc of saline with 10% laevulose and vitamin B and C intravenously; 8 hours later 1000 cc of saline with invert sugar and electrolytes are given. A sub-emetic dose of apomorphine, 0.2 - 2.2 mg, is given by injection. This is followed within 15 minutes by sleep. Diet supplements of orange juice, honey, yeast, brown sugar, and protein supplements are recommended. Oxygen inhalation is helpful if there are signs of delirium. After the patient is discharged, he is seen weekly for the next 7 weeks when he is given sub-emetic doses of apomorphine.

An antihistamine, Pyrilamine maleate, has been used by Stern on 11 patients. It was thought it might break the cycle produced when alcohol is used to relieve the effect of histamine-like metabolites which are produced by alcohol intake. He used 50 mg, 3 times a day orally, from 1 - 21 days. All patients reported a loss of desire to drink. 3 patients resumed drinking while on the medication, 3 resumed after medication was discontinued, and 5 broke contact.

Stern concluded the best a pharmacological agent can do is to overcome the immediate craving for alcohol. Pipradol, a true central nervous system stimulant, has been used by Proctor in treatment of alcoholism with depressions. His dosage is 2 mg twice a day for 7 - 10 days. There was no letdown when the drug was discontinued. For a 12 months period, 18 of the 25 males remained sober; 3 had one relapse. 10 of 15 females stayed abstinent; one had a single relapse. However, in this series, not all credit can be given to the drug since psychotherapy was practiced concurrently.

Use of intensive electrical shock is reported by Milligan in the treatment of chronic alcoholism on a total of 50 patients during a 10 year period. These were given electric shock 2 or 3 times a day until the desired level of confusion was achieved and maintained for 7 - 10 days. This author reported that all patients improved. 28 remained abstinent; those who had relapses did so, not because of any craving, but because they thought it would do them no harm to drink.

One can see that numerous techniques of therapy have been tried with a variety of responses in the treatment of chronic alcoholism. Only the more popular and successful therapy regimens have been discussed in this paper. The therapist must possess considerable patience in perpetuating contact with these patients. It must be remembered that many alcoholics are unproductive, restricted in

interest and activity, and resist self-examination. They are guided by external pressures, dread impulses, and experience guilt concerning them. They feel guilty before drinking and after indulgence. The chronic alcoholic tolerates anesthesia poorly. He may have a stormy post-operative period. Most alcoholics are not aware of the seriousness of their problems and consent to treatment only when subjected to external pressures. Many physicians may not recognize the tendency of alcoholics to become addicted to other drugs.

Ford reports on 139 patients in a psychiatric department of a general hospital with the diagnosis of chronic alcoholism. 32 were regularly taking another drug with the alcohol; 17 were addicted to one or more drugs, barbiturates by 16; opiates by 8, and amphetamines by 4. He also mentions the danger of convulsions or a chance of exaggerating a depression when the drugs are withdrawn. Ford acknowledges the need for sedation but, at the conclusion of the therapy, the patient should be off all sedatives.

Golder considers qualifications of the physician's office nurses as being important. They should have a thorough understanding of the patient and a belief that this is an illness and not a moral offense. The nurse should be emotionally and mentally mature enough to be content with improvement, not necessarily cure. They should keep close contact with the patient and observe

him carefully. One should remember that every contact with the alcoholic in the office or hospital gives him an opportunity to get a new start toward the adjustment to abstinence. This contact may be his chance to change.

ACUTE PSYCHOSIS IN CHRONIC ALCOHOLISM

There are many phases of acute psychosis in the chronic alcoholic. They are generally difficult to define or differentiate, although, according to some authors, there are distinct differences. These fall into four general categories; they may occur in the sequence to be mentioned, as any variation thereof, or as a single entity. The usual sequence, seen where all 4 stages occur, is as follows: tremors, hallucinations, convulsions, and delirium. Not all authors make these distinctions, but they may consider them all as phases of delirium tremens. Since the usual interpretation of "DT's" is rather broad, I will here consider these various phases as subdivisions of delirium tremens.

The etiology of delirium tremens is still uncertain. Sudden withdrawal of alcohol is often considered sufficient to cause a reaction. It is commonly thought that most acute psychoses occur during abstinence following a drinking spree. Piker, in 1939, showed that 75% of the patients admitted to a hospital for delirium tremens had developed this condition while drinking. He also showed that chronic alcoholics rarely developed delirium tremens while in jail. This series of cases studied was impressive enough to cause some doubt that abstinence is a cause of delirium tremens.

Excessive cerebral edema as a cause of delirium tremens was presented by Steineback in 1915. He also believed a toxin was

present in the cerebral spinal fluid which would help initiate the psychosis. This "wet brain" theory was the basis for repeated spinal drainage and replacement by isotonic NaCl. This was done to reduce spinal fluid pressure and dilute the toxin.

Other factors may be considered to have some part in the etiology. These can be faulty metabolism of carbohydrates and protein, disturbed detoxifying function of the liver, acidosis, disturbed water balance, nutritional deficiencies, and absorption of toxins from the gastrointestinal tract. Sudden illness, surgical procedures, or injury may precipitate delirium tremens.

The phase of tremors generally occurring first and most frequently is also known as the "shakes" or "jitters." This usually occurs in the first twenty-four hours after the last drink (assuming the patient has been on a drinking spree for a week or so). The patient will become increasingly anxious, apprehensive, and agitated. Some of these feelings may be alleviated by a few drinks at first, but will recur and, as time passes, will not be responsive to alcohol. The patient may have some gastritis and/or enteritis, causing nausea, vomiting, diarrhea, and abdominal pain. Insomnia will increase; so will anorexia and food intolerance. There may be considerable abdominal muscle rigidity (often referred to as "rum belly"), and some authors believe this is due to pancreatic involvement. Cases have been noted in which abdominal distention was concurrent with increased blood amylase.

Physical examination often reveals a coarse tremor which will be accentuated during attempted movements such as eating or lighting a cigarette. This tremor is not only of the hand, but of the tongue and lips; and the patient will feel "shaky" inside. These people are ordinarily dehydrated and poorly nourished. If a peripheral neuritis is present, it is usually accompanied with a decrease or absence of deep reflexes. If the patient is anxious or in a state of panic, the reflexes may be hyperactive.

A portion of patients with tremors will have feelings of paranoia with their anxiety. This may progress into the more active phase of the psychosis when the patient will hallucinate and become delirious. This is commonly known as the "horrors."

Apprehension is fairly common and the subject is often highly suggestible; if asked, he may clearly read a sentence from a blank wall. External stimuli are usually misinterpreted as a threat to his security. He may consider any loud noise to be someone shooting at him. Visual hallucinations are generally more common than auditory or tactile hallucinations. This patient may hesitate to walk as he is afraid of stepping on his glasses which he imagines are on the floor. Strange animals of various sizes and shapes may threaten him; inanimate objects may begin talking to him in a derogatory manner; and imaginary insects will have to be brushed off his skin. Some patients may awaken from a drinking bout with vivid memories of a frightening dream, and these events can be so realistic

that the patient will require substantial proof before realizing they were only dreams. These external threats are extremely frightening to the patient who will resort to great measures to eliminate the "dangers" which seem so real to him.

The true delirious state may show considerable variation. In its mild form, the patient may have intermittent periods of delirium, alternating with alertness and insight. More severe cases are apparent when the patient is showing general motor and autonomic hyperactivity, trembling, perspiring profusely, markedly confused, and unable to speak intelligibly. The delirious state may not occur for several days after cessation of alcohol intake. It may occur by itself or follow a sequence of tremors, hallucin-ations, and seizures.

Some alcoholics admit an intermediate phase of convulsions and extensor spasms referred to as the "rams." Seizures may also occur during the delirious period when they are known as "rum fits" or alcoholic epilepsy. There is some question that this is a variant of epilepsy.

Greenblatt reported one series in which there was no demonstrable increase in abnormalities of electroencelphalography of these patients with convulsions during their delirious period. A series of 1254 cases of epilepsy were examined further regard-ing their alcoholic habits. It was learned that evidence of heavy drinking was no greater among epileptics than with the general

population. However, it was conceded that about one-half the epileptics that drank heavily had more severe seizures. It is entirely possible that excessive drinking may precipitate a latent epilepsy or cause seizures to be manifest in an appropriate constitution. One must also keep in mind the development of idiopathic epilepsy and other brain disease in this same age group that is involved in the problem of chronic alcoholism.

Acute alcoholic hallucinosis has some distinct differences from the usual delirium tremens. It has sufficient characteristics to be classed by some authors as a separate entity. These hallucinations are primarily auditory in type. The voices heard are usually threatening and derogatory. Except for the anxiety produced by the hallucination, there is less psychomotor activity than is seen in delirium tremens. The patients are well-oriented and remember well any events during the hallucinating period. There is no amnesia as is seen in delirium tremens. These patients are, as a rule, less suggestible in the active phases, and, afterward, begin to doubt the reality of the hallucinations. This may progress to the point where the patient does not react appropriately; the voices are less vivid and more difficult to elicit. There may be a transition to paranoid delusions. These psychotic stages may last for months and be very difficult to differentiate from schizophrenia.

Since the cause of delirium tremens is not fully known, the

treatment is mainly symptomatic in an effort to shorten the duration of the delirium and enable the patient to better tolerate this condition. In recent decades, alcohol has been used less in the control of delirium tremens. There is some doubt as to whether it is beneficial in controlling delirium, as well as doubt whether its abrupt withdrawal is the precipitating factor in initiating the episode. Another distinct disadvantage is that considerable dependence on the alcohol may be formed, thus hindering and prolonging the final cure of the alcoholic. The treatment of the "wet brain" has been previously mentioned. Since the 1940's, there has been a complete reversal of this therapy concerning fluids. When patients were given 3 - 4 liters of fluid daily, along with considerable sodium chloride, the mortality dropped to one-third of what it had been on dehydration.

Those conditions serious enough to be included in the category of acute psychosis are usually in need of hospitalization. Because of the need of a well-trained nursing staff and continuous observation, it is recommended that this be a general hospital, even though, on first impression, one might consider a psychiatric institution as adequate.

The following therapy is that recommended for acute delirium tremens. However, it can, and should, be adjusted to the specific patient according to his degree of psychosis. The patient should be placed in a private room, well-lighted to eliminate many of the

fears of shadows and darkness. A member of his family should be present if private nursing care is not available. This will help insure safety of the patient. Pulse and blood pressure should be taken every 2 hours in the acute phases as a means of detecting any cardiovascular collapse as this has often been a cause of death.

Any procedures, such as taking blood pressure or giving intravenous injections must be clearly and completely explained to the patient to eliminate another source of fear and misconception on his part. To conserve the patient's strength, he should be placed on bed rest. He should not be mechanically restrained since many patients have expired from sheer exhaustion as a result of excessive struggling. All alcohol should be immediately withdrawn; gastric lavage is recommended to remove any alcohol in the stomach or products of gastritis. If the cardiovascular system is excessively depressed as a result of the alcohol, caffeine may be injected to strengthen heart action. Digitalis has been used in some cases because of the finding of toxic myocarditis and acute cardiac dilatation in certain cases dying in the delirious phase.

Sedation in the severe phases of delirium tremens is very important. Only a few drugs are considered acceptable because of the large doses often required and because side effects frequent-ly arise. Of the barbitals, only the long-acting drugs are recommended. Mephobarbital (Mebaral), 3 grains 4 times a day, is quite effective in reducing tension and irritability without causing

euphoria or clouding of the consciousness. Another barbital (Veronal) has the advantage of being excreted by the kidney without causing additional strain on the liver. Its dosage is 5 - 10 grains 4 times a day.

Paraldehyde is the drug most commonly used and is very effective if given in adequate amounts. One may give initial doses of 16 cc orally, followed by 8 - 12 cc every 1 - 4 hours as needed to control the delirium. One may use an equal amount rectally if this is not tolerated by mouth. 2 - 8 cc may be given intramuscularly, but the drug should never be given intravenously. There have been reports of pulmonary edema and hemorrhage and right heart dilatation as a result of excessive dosages.

Chloral hydrate is also effective. 2 grams may be given initially and 1 gram every 3 hours thereafter for the first 24 hours. This drug, though usually well tolerated, is contraindicated in advanced liver and renal disease. Some early reports indicated some success in therapy with adrenal cortex extract and Corticotropin. A more recent series with the use of adrenal cortex extract provides less support to its virtues as previously reported.

The patient should be encouraged to drink large quantities of orange juice or receive 100 cc of 50% glucose intravenously, if necessary, as often as every 3 hours. This is a means to introduce large amounts of carbohydrates for nutrition. One may give 15 - 20 units of regular insulin 3 - 4 times a day as a means of

hastening the metabolism of alcohol. A day's fluid intake should be approximately 3 - 4 liters. If this is parenteral, at least 500 cc of one-sixth molar sodium lactate and 500 - 1000 cc of sodium chloride should be included to reduce acidosis and dehydration. The balance of solutions may be 10% dextrose and water, or, if orally, milk and orange juice may be used. If all fluid is taken in orally, there should be capsules containing 2 grams of sodium chloride given every 4 hours. Fluid intake may be altered if the cardiac status is such that heart failure may be initiated. Occasionally, enemas may be used daily to alleviate chronic constipation and provide additional fluids.

Specific vitamin deficiencies in these cases are difficult to evaluate since most of the patients are malnourished. Some case reports implicate either or both thiamine and nicotinic acid deficiencies in developing delirium tremens. To counterbalance the possible vitamin deficiencies, supplemental administration of B complex and vitamin C are given. This may be orally or parenterally, if needed. Calorie intake should be 3000 - 4000 per day, high protein and carbohydrate. Because of the gastritis which is often present, one may have to tube feed or start with eggnogs and increase varieties of soft diet as tolerated.

The usual duration of acute delirium tremens is 3 - 10 days, followed by prolonged sleep. By following the proposed therapy, one may shorten the course by several days. Mortality in the

the hospitalized patient with modern therapies ranged from 5 - 15%. Most of the deaths are due to heart failure and pneumonia. Occasionally this psychosis may develop into the Korsakoff's psychosis. Ultimate prognosis depends considerably on the general health of the patient and the existence of a concurrent systemic disease.

Generally speaking, if the patient is watched closely and is given therapy for his systemic symptoms, he will improve and the acute course of his illness will be considerably shortened. He will then be available for additional long-term therapy previously described in another section.

SUMMARY

Alcohol intoxication exceeds all other toxic poisoning combined in number of cases. 70 million Americans imbibe to some extent. About 12,000 die each year from the effect of chronic alcoholism. The majority of alcoholics are not from skid row but include professionals, executives, skilled and non-skilled workers. The population can be divided into four groups: the abstainers, the occasional social drinkers, the regular daily drinkers, and the chronic, uncontrolled addicts.

A complete work-up is needed if an accurate plan of therapy is to be successful. This examination includes a history, physical, and neurological examinations, laboratory tests, psychiatric evaluation, mental status, psychological testing, and social history since this condition very intimately involves the physical, psychiatric, and social fields.

Psychiatric treatment is either on an individual or group basis. To some degree, this is used without formal intent and can be used by the non-psychiatrist. The patient's family often needs counselling to accept him in his new status.

The patient should be hospitalized in a general hospital for a short time during the initial withdrawal period. The alcoholic should be treated as any other patient, in as much as possible, to eliminate feelings of discrimination.

Alcoholic coma occurs more often than most physicians realize.

Differential diagnosis is important to rule out other causes. One should observe carefully to detect early signs of respiratory distress, shock, and trauma.

Oxygen, resuscitation, and stimulants may be necessary. The usual treatment of shock is used, if necessary. Gastric lavage is helpful anytime that sufficient amounts of alcohol are present and potentially dangerous. A sippy or very bland diet is of benefit during the stages of gastrointestinal upset. Insulin and dextrose combinations aid in increasing the alcoholic metabolic rate. Sedatives and tranquilizers are necessary during the withdrawal phases of excitement.

Protective drugs are quite effective in assisting the chronic alcoholic patient to remain abstinent, but are ineffective with-out full cooperation of the patient. The adrenal extracts, ACTH, and vitamins have been used with varying degrees of success, depending primarily on the particular patient. Sedatives are not often used, except for occasional aid to sleeping. They present the danger of habituation and must be used carefully, if necessary, over a long period of time. Other agents and methods, including electric shock, stimulants, and antihistamines have been used on small groups with questionable success.

Delirium tremens consist of several stages which may occur in sequence or alone. Tremor is usually seen first, followed by hallucination, convulsions, and delirium. The wet brain method

of treatment is no longer accepted. The patients are adequately sedated to reduce tremor or convulsion. Considerable fluids, as well as an adequate diet, are given as soon as tolerated in order to prepare the patient for more definitive therapy. Nursing care and hospital environment are very important, especially for the psychotic patient.

CONCLUSIONS

1. The alcoholic must have a sincere desire to quit drinking. This does not usually occur until the patient has suffered great personal loss or when the pain associated with drinking is worse than the suffering of abstinence from alcohol.
2. Certain stages and situations involving alcohol must be regarded as medical emergencies. Although infrequent, deaths do occur during alcoholic coma. The primary concern during the acute phase is to assist the patient to survive the pre-sent episode and be as comfortable as possible. This may be directly dependent on adequate medical management.
3. Since the alcoholic has psychiatric and social problems, these, too, must be considered. Psychiatric aid is vital in a certain percentage of patients who do exhibit deep-seated mental disturbances. Often times, assistance from the proper authorities must be sought to aid the patient with his social problems.
4. The general practitioneer can provide considerable assistance to the majority of alcoholics and their families if he will take advantage of sources of aid available. By good medical therapy, abstinence can be maintained for long periods, or even indefinitely, if the patient is cooperative.
5. The alcoholic can be a most disgusting, annoying, exasperating patient. Yet, when willingly cooperative, or cured, he may provide a worthwhile and satisfying experience to the physician.

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