IMPRESSIONS ON THE USE OF "ANTABUSE" IN THE TREATMENT OF ALCOHOLISM IN THE ARMY

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INTRODUCTION
The value of tetra-ethyl-thiuram-disulphide in the treatment of those addicted to alcohol has been widely reported in the literature. It is sold under various proprietary names of which "Antabuse" is probably the best known in England.

In view of the promising results reported on the use of "Antabuse," permission was obtained to use the drug on service personnel.

Alcoholism as used in this paper signifies "abnormal" drinking habits. The normal drinker is the social or moderate drinker who may even on occasion drink to excess but has no particular craving for alcohol and is able to control his indulgence in it. Abnormal drinking is defined by Bowman and Jellinek (1942) as "habitual indulgence in alcoholic beverage beyond the limits of merely satisfying thirst or of using the alcoholic beverages in the sense in which a condiment is used, or in its formal social use, or as an occasional stimulant." None of the series herein reported were chronic alcoholics which is recognized clinically as permanent physical and mental impairment following the prolonged use of alcoholic beverages.

Treatment was carried out in the Royal Victoria Hospital, Netley, and first commenced in March 1950. The authors have had the opportunity to follow up 10 cases over a period of twelve months. This was made possible by the co-operation of Area and Command Psychiatrists who interviewed these patients at regular intervals, and by personal communications from relatives and patients concerned.

Antabuse is a medicinal trade name of a substance used for several other purposes. The substance has the following formula:

\[
\begin{align*}
\text{C}_2\text{H}_5 & \quad \text{S} & \quad \text{S} \\
\text{C}_2\text{H}_5 & \quad \text{NC} & \quad \text{S} & \quad \text{S} & \quad \text{C}_2\text{H}_5 \\
\end{align*}
\]
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This series is too small to reach any definite conclusions. They are, however, the first records of patients treated with “Antabuse” in the Army. All cases were officers and all had distinguished war records and were above average intelligence.

The average age of this small group was 38 years, the youngest being 32 and the oldest 45 years.

All had come from good homes where drinking was moderate and not discouraged. The majority had first taken alcohol at the age of 18 years after leaving school. In all cases beer and an occasional sherry were the first alcoholic beverages consumed, which lead on occasions to excessive consumption with the usual “hang over.” Later and particularly during the war years and after all varieties of alcoholic beverage were consumed in excessive quantities, either as a regular habit or in bouts of two to three days with several months of sobriety.

All were faced with the possibility of disciplinary action and ultimate discharge from the Service if medical treatment could not cure them of their alcoholism. All, if cured, had many years to serve before retirement and their practical experience was invaluable to the Army.

All were admitted in a toxic condition and their breath smelt strongly of alcohol. All except one were heavy smokers whose fingers were darkly stained with nicotine. None were pipe smokers. In all, except 2, their personal hygiene left much to be desired, and their battle dress or uniform in which they arrived at the hospital was stained and untidy.

Effect of the Drug

Hald and Jacobsen (1948) proved conclusively that “Antabuse” is non-toxic to the human body so long as alcohol is not consumed. They showed, however, that when alcohol is imbibed after the drug is taken, that toxic symptoms occur.

The drug has the effect of sensitizing the patient to alcohol. It acts by interfering with the metabolism of alcohol in the body, giving rise to a rapid accumulation of acetaldehyde in the blood stream. Asmussen et al. (1948) showed that the combination of “Antabuse” and alcohol produced increase in ventilation and a decrease in alveolar carbon dioxide. They concluded that the combination produced a substance which directly or indirectly increased the irritability of the respiratory centre. They noted an increase in cardiac output and in pulse-rate. They also proved that the intravenous injection of acetaldehyde produces the same symptoms as those observed in patients treated with “Antabuse” who have been given alcohol.

Stotz (1943) proved that small amounts of acetaldehyde are found in normal people after taking alcohol.

Hald and Jacobsen (1948) ascertained that in those who had taken “Antabuse” and alcohol, blood acetaldehyde levels were raised up to five times those of normal people after taking alcohol. They observed that about 20 per cent of a given dose is excreted in the faces during the following one to three
days. They postulate that the protracted action of the drug is due to fixation of the drug in the tissues after absorption. They noted that "Antabuse" did not interfere with the rate of alcohol elimination from the organism.

The toxic symptoms arise from the effect of the drug on the cardiovascular and respiratory systems. They include a feeling of heat followed by intense flushing located principally in the face, spreading in some cases to the neck and upper parts of the chest and arms, or even the abdomen. A constant effect noted was dilatation of the scleral vessels, making the person look "bull-eyed." The pulse-rate is raised to 120-140 per minute and cardiac output is increased. The blood pressure is unaffected. These symptoms were followed by palpitations and sometimes slight dyspnœa. More frequently, however, the patients feel a mild irritation in the throat or in the trachea which results in slight coughing. After large doses of alcohol are consumed following the injection of the drug, nausea and vomiting often developed. They noted that when the nausea was intense, the blushing gave way to pallor. At this stage there may be a considerable fall in blood pressure, headache was also frequently present.

These symptoms last from two to five hours and then gradually disappear, leaving the patient drowsy. The day after, the patient feels lethargic and listless, but can carry on his work.

Carver (1949) has in addition to these symptoms described giddiness and hammering in the ears and a feeling of anxiety and distress in the patient. He observed that symptoms occur within a quarter of an hour of taking alcohol. Larsen (1948), however, appears to consider that the period of time varies before the initial production of symptoms. He reports one drinker in whom symptoms failed to develop for a period of one hour.

All authorities are agreed that the intensity and duration of the symptoms depend on the dose of alcohol and the idiosyncrasy of the individual. Symptoms are seen after every kind of alcoholic beverage, including beer, wine and spirits.

Much of the earlier literature tends to regard the treatment as of little real danger and advocates out-patient treatment. Hald, Jacobsen and Larsen (1948) allege that a fully developed collapse is never seen in patients treated with "Antabuse." Jones (1949), however, warns of the danger of sudden severe reaction even in young adults and records a case of death following the ingestion of one ounce of rum in a 29-year-old white male treated with "Antabuse." Some cases of convulsions and allergic skin reactions have been recorded (Chevens, 1949), and a few patients passed into a maniacal state. Gelbman and Epstein (1949) report convulsions followed by unconsciousness and hemiparesis occurring in a man of 58 who was a mild diabetic undergoing treatment.

Carver (1949) and Chevens (1949) are of the opinion that the patient should be kept in hospital during his initial treatment and this is the generally accepted view of those with experience in using the drug. The latter, in a personal communication, states that it is quite unjustified to give this drug without the knowledge of the patient of the risks he runs if he drinks. He also issues a note of warning of the legal complications which might arise in a fatal
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case, if the physician has not fully acquainted the patient of the dangers of the drug.

Contra-indications.—Special contra-indications are marked arteriosclerosis with hypertension and serious damage to the liver. Some authorities consider that patients who have been taking paraldehyde should not be given "Antabuse." Gludd (1949) recommends that patients suffering from the following conditions should either not be given "Antabuse" or should be treated with the greatest caution:

1. Myocardial failure or disease.
2. Sclerosis of the liver.
3. Chronic or acute nephritis.
4. Epilepsy.
5. Goitre.
6. Pregnancy, in case of damage of the foetus.
7. Drug addicts.
8. Diabetes mellitus.
9. Asthma; which is made worse.
10. Disease of the haematopoietic system.

Administration and Preparation

All authorities stress the importance of a thorough medical examination of the patient before giving the drug. This includes thorough physical investigations and a detailed study and examination of the psychiatric and social background of the patient. They stress special attention to the cardiovascular system and liver. Most authorities consider that the patient should be got physically fit with a brief period of hospitalization prior to treatment. Some consider electrocardiograms should be taken in every case as coronary attacks have been reported following ingestion of alcohol in patients taking "Antabuse." All authorities are agreed that one must treat the individual and environmental stresses of the patient with psychotherapy. The drug is useless unless the underlying motivation are dealt with, since there is a danger that the unconscious urges which gain neurotic gratification in alcohol, will, if this means of escape is denied by pharmacological means alone, break out in some other objectionable form.

Patients should be carefully selected for treatment and must be desirous of giving up alcohol and be prepared to make an honest effort to co-operate in overcoming the habit. Bowman (1950) stresses that giving the drug surreptitiously without the patient's knowledge is a dangerous procedure and will not succeed in getting him off alcohol.

The object of the treatment is to sensitize the patient to the effects of alcohol in combination with "Antabuse" and by maintenance doses of the latter to help him to avoid the consumption of alcohol in the future.

Larsen (1948) observed in a large series of cases that the patients on this treatment lose their desire for alcohol, and this is generally agreed by all who
have experience in using this drug. All authorities are agreed that the chief value in the drug is that it paves the way for psychotherapeutic procedures.

Barrera et al. (1950) state that the effect of "Antabuse" lasts ten to fourteen days after discontinuance of the drug and sometimes longer.

**CAUSES OF ABNORMAL DRINKING**

Those experienced in treating alcoholics agree that heredity plays no part in the aetiology of abnormal drinking. It was felt, however, that investigation into the personality structure of the patients in this series might elicit some traits which would indicate reasons for excessive consumption. In every case a careful investigation into past medical history, development, progress in school, employment and Service life and family history and social background was made. These investigations revealed nothing of significance.

In one case the parents were divorced when the patient was 12 years old. He saw his father for short periods annually and on these occasions was happy. He lived with his mother who re-married an aggressive, domineering man who drank heavily and of whom the patient was terrified. The latter was lonely, solitary and introspective and afraid of punishment in school.

In two other cases the father was a heavy drinker and in one of these the patient's brothers also drank to excess on occasions.

In one case the patient's childhood was happy for the first five years when his mother died and father re-married. After this the children were dispersed to relatives and the patient's formative years were spent in an unstable and adverse environment. The remaining patients had a stable and apparently happy childhood.

All patients in this series were married. In one the patient's wife formed a liaison during the war and left the patient. After this event the patient commenced drinking heavily. Of the remainder marriage was happy except during their alcoholic bouts which caused considerable disharmony in the home.

Psychiatrists generally regard alcoholism as a symptom of mental ill-health. The latter being used in its widest concept to include psychosis, psychoneurosis or minor social maladjustments. No evidence of any psychotic illness was found in any of this series. Nor was any brain injury or organic disease thereof found in detailed investigation of the central nervous system. One patient was a psychopathic personality who was emotionally unstable, irresponsible and impulsive and whose attitude to life was the gratification of his own wishes at all times. All the other patients were predominately social drinkers who had drifted into abnormal drinking without knowing it. The outstanding characteristics obtained from relatives and friends who knew these patients well was marked shyness and feelings of inferiority when sober. They were sensitive and very resentful of criticism and moody. They exhibited restlessness and uneasiness in company and a general tendency to "chain smoking." After a few drinks they became happy and calm.
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INVESTIGATION AND TREATMENT

All patients were treated by the authors as in-patients. On admission they were put to bed and ordered a bath. All alcohol was removed from them. No visitors were allowed except immediate relatives who were interviewed before seeing the patient. This was done to ensure that no alcohol was surreptitiously brought for the patient as it was anticipated that this was likely to happen. It also provided an opportunity to give detailed information to the relatives regarding diagnosis, treatment and disposal. This precaution proved its value as relatives had on occasions been unaware of the reasons for the patient’s admission and had inadvertently brought alcohol at the request of the patients concerned. A purgative was administered and each was put on large doses of vitamin B₁ and B₂. A normal diet and copious glucose fluids were given. Full physical examination was carried out on each case, including routine laboratory investigations with urine examination, total red and white blood cell count and differential white cell counts. Septic foci were treated. The B.S.R. was also carried out but was only significantly high in one patient with pyorrhœa. It rapidly fell after teeth were removed and gums healed.

In only one patient was an electroencephalogram taken. This was a patient subject to periodic bouts of drinking every two to three months. For a few days prior to indulgence he felt restless, tense and irritable. During the bout he became violent and on one occasion his aggressiveness resulted in civil police proceedings. The investigation demonstrated no cerebral dysrhythmia at rest or after hyperventilation.

All patients had tender, palpable livers and in each liver function tests were carried out. These were normal in all cases. In none was there evidence of peripheral neuritis. Sedatives and hypnotics were withheld and were in fact not required as all patients slept well. No alcohol was permitted in any form.

After one to three days all exhibited withdrawal effects of alcohol with marked parasympathetic over-activity indicated by abdominal “cramp-like” pains, sweating, salivation, lachrymation and bronchial catarrh and a craving for alcohol. These symptoms were accompanied by extreme restlessness and tremors of the lips, tongue and distal parts of the upper limbs. These effects were counteracted by giving the patients belladonna and small doses of insulin. Within forty-eight hours all these symptoms had cleared up, and patients allowed up.

Antabuse Regime.—Carver (1949) administered the drug by two methods. One method was to admit the patient to an institution and after detoxication he gave 1 gramme followed next day by 0.75 gramme at breakfast. He allowed the patient on parole and did not inform him of the symptoms which would arise if he consumed alcohol. The physician draws the obvious conclusion and explains to the patient that the susceptibility of persons under treatment is such that any lapse is liable to be fraught with unpleasant symptoms. His second method is to discuss frankly with the patient the way the drug can be used to cure his individual case. He is warned of the effects and it is made clear to him that it can temporarily help his resistance to alcohol.
Others experienced in the use of this drug give larger doses, notably Gelbman and Epstein (1949) who commence with an initial dose of 2 grammes on the first day, 1.5 grammes on the second day and 1 gramme on the third day.

In this small series the treatment was frankly discussed with the patient and relatives and a warning given of the effect of alcoholic consumption. Permission was in all cases given freely as patients were genuinely desirous of being cured of their habit. When the patient was clinically considered physically fit treatment with "Antabuse" was commenced. Each patient was given 1 gramme of "Antabuse" at 9 p.m. The following morning he was given another 1 gramme at breakfast. That afternoon sensitization was begun. He was given 2 oz. of whiskey either neat, with soda, or water, and this dose was repeated every quarter of an hour until the patient became pale and vomiting ensued. This treatment was carried out in a room specially equipped for the purpose. Oxygen cylinders were tested and ready for use. Nicotinic acid and coramine were available with sterile needles, and ascorbic acid tablets, glucose solutions for intravenous and oral administration were to hand. The patient's reactions were carefully recorded and blood pressure readings taken every quarter of an hour. The reactions followed closely those of other workers and in no case was the blood pressure raised. No reactions were severe enough to cause alarm. Recovery varied from 4 to 6 hours when the patient felt no ill-effects other than a sensation of drowsiness. This regime was repeated next day when reactions were similar though much accelerated, more severe and prolonged. In no case was it necessary to repeat sensitization.

Thereafter the patient was given a daily maintenance dose of 0.5 gramme of "Antabuse" with breakfast. He was kept in hospital for a further week, allowed up and encouraged to take exercise and allowed out on parole for specific hours. He was made to carry a card in a place likely to be seen on which was written "ON ANTABUSE. NO ALCOHOL TO BE GIVEN IF I COLLAPSE." The purpose of this was to protect him from any Samaritan who might try to revive him with brandy or other alcoholic beverage. The patient was then sent on one month's sick leave in the care of relatives. He was given an adequate supply of the drug to continue his daily maintenance dose and carried his special card. The relatives were asked to provide weekly reports on his progress and in no case failed to do so. The patient was instructed to report back for further assessment after sick leave. He was fully assessed clinically and returned to duty. Full details of each case were sent to the unit medical officer and to the Command psychiatrist. This was regarded as important because it was recognized that to give patients medicine which has an alcoholic basis for other complaints would be dangerous.

The maintenance dose was reduced to 0.5 gramme every second day for the second month and every third day for the third month. Thereafter the patient was recommended to take 0.5 gramme at weekly intervals for a further three months.
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RESULTS

Eight patients in this small series are still serving in the Army. Of these 2 relapsed on one occasion only within three months and took a small amount of alcohol. The effect was such that no further relapse ensued. None of these have consumed any alcohol since and are doing satisfactory duty in the Army. It is of interest that one of these had previously been treated on two occasions in a civil hospital with apomorphine and insulin on respective occasions with no success.

Two patients resigned their Commission and their resignations were accepted by the Army Council. One failed to keep in touch and the authors have no knowledge of him. The other obtained a good civilian appointment and has not relapsed so far.

One patient was a psychopathic personality and one of the earliest treated. This patient did badly and was eventually discharged the Service. He was not a suitable case for treatment as he failed to co-operate in his treatment.

CONCLUSIONS

These results indicate that "Antabuse" does assist patients to overcome the habit of overindulgence in alcohol.

All patients who responded well to treatment were highly intelligent and genuinely desirous of overcoming their handicap which was seriously affecting their efficiency.

The relatives of those who responded well gave every encouragement and assistance and probably had much to do with the results obtained.

Success depends also on the patient's co-operation in taking the drug as ordered and on careful observation and follow-up by those responsible for their treatment.

The initial sensitization should be carried out in hospital with the patient under constant observation with all available means ready for any complications which might ensue. The drug is too dangerous to use in out-patient treatment.

The medical officer of the unit and the Command psychiatrist concerned must be given full case notes and their co-operation obtained in keeping the patient under observation for the first six months.

SUMMARY

The use of "Antabuse" in the treatment of abnormal drinking in the Army in a small series of cases is recorded.

The necessity for the admission to hospital of all such cases for detoxication and sensitization is emphasized. The drug is unsuitable for out-patient treatment in the Army.

Extensive investigations revealed no conclusive personality traits on this series.

All had the characteristics of shyness, sensitivity, inferiority feelings and
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exhibited tension and restlessness in company when sober. They were pre-
dominantly social drinkers who drifted into abnormal drinking almost without
knowing it.

The co-operation of patients, relatives and medical personnel responsible for
their treatment is stressed.

The necessity for the patient to carry a special card indicating that he is
on "Antabuse" treatment and must not be given alcohol is emphasized.

REFERENCES


BOWMAN, K. M., and JELLINEK, E. M. (1942) Alcohol Addiction and Chronic Alcoholism,

12, New Haven, York.


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