

frequently involved are the head and neck structures, lungs, and gastro-intestinal tract. Only in the first, however, has a definite and pathognomonic clinical syndrome been recognized (Bauer *et al.*, 1955; Baker, 1957; McCall and Strobos, 1957; Dwyer and Changus, 1958; Hutter, 1959), while, in the latter two, signs and symptoms related to mucormycosis are obscured by the underlying disease.

After sinusitis the mucor spreads to surrounding tissues, especially the periorbital tissue, causing thrombosis of the retinal artery, complete ophthalmoplegia, and blindness. Further spread causes meningitis and involvement of the ophthalmic and carotid artery with thrombosis of these vessels.

This case clearly demonstrates the typical syndrome, especially the triad of uncontrolled diabetes, unilateral periorbital infection, and meningoencephalitis. The case reports in the literature of mucorales involving head and neck structures show very similar features (Smith and Yanagisawa, 1959). Diagnosis of mucormycosis of the head should therefore present little difficulty if one is acquainted with the typical features of this syndrome, and it can readily be confirmed by mycological examinations.

In our patient we could demonstrate specific intradermal reactions with autoclaved culture extracts, and a positive complement-fixation test was obtained when this extract was used as antigen. If the numerous species belonging to the Mucorales have a common antigen, immunological tests of the kind described could be of value in cases of suspected mucormycosis, where isolation of the causative organism is difficult or impossible.

Prognosis and Treatment

The prognosis in the visceral forms appears to be uniformly poor. Survival from mucormycosis involving the head and neck structures has been the exception rather than the rule.

Hutter (1959) found only 7 survivals in 24 cases of cerebral mucormycosis. In the pulmonary and gastro-intestinal cases survival has been rarer still. Possibly awareness and earlier recognition will improve the outlook in the future.

No specific therapeutic agent against the fungus is known. Amphotericin B has recently been thought to be of value (McBride *et al.*, 1960). We doubt whether griseofulvin had any effect in our case, nor are we convinced that nystatin was of value, although *in vitro* the fungus was very sensitive to it. However, nystatin is not absorbed from the gastro-intestinal tract and therefore is unlikely to affect remote fungi.

Anticoagulant therapy may have prevented further extension of thrombotic lesions and is probably worth a trial if there are no contraindications to its use. Probably of much greater importance is the early management of the diabetes and other predisposing diseases and the supporting treatment of the severely ill patient.

Summary

A case of mucormycosis involving head and neck structures has been described. The rather typical clinical picture has been stressed. A specific intradermal reaction and a positive complement-fixation test were demonstrated.

We are indebted to Dr. C. W. Hesselstine, Agriculture Research Service, Peoria, Illinois, for classification of the culture.

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CASE OF HOMOSEXUALITY TREATED BY AVERSION THERAPY

BY

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Hadfield (1958), in an interesting paper on the cure of homosexuality, defines "cure" as meaning that the patient "loses his propensity to his own sex and has his sexual interests directed towards those of the opposite sex, so that he becomes in all respects a sexually normal person." He quotes the Wolfenden report—"none of our medical witnesses were able, when we saw them, to provide any reference in medical literature to a complete change of this kind." He further maintained that the process of cure was a long one, and that the main benefit of investigating cases of homosexuality is that the cause of the condition may be ascertained and that means of prevention may be found.

The report by Curran and Parr (1957) of a series of 100 homosexuals seen in private practice, in which those patients treated psychotherapeutically derived no apparent benefit in terms of changed sexual preference or behaviour as compared with those matched patients not so treated, adds to the feeling of therapeutic impotence which the practitioner so often feels when faced with the problem of homosexuality.

A special Committee of the Council of the B.M.A. (1955), in a memorandum on homosexuality and prostitution, laid stress on the need for research into the treatment of homosexuals.

The case here reported is thought to be of special interest in that to some extent the patient acts as his own control as previous methods of treatment had been unsuccessful.

Case Report

Male, single, aged 40 years. Mother alive and well. Father, who had been married before, died of cancer when patient was aged 16. There is one half-sister and one half-brother.

His homosexual drive was first apparent at the age of 15, and his first homosexual experience was at 18. Since then he had been exclusively homosexual, girls having no physical attraction whatever, physical contact with them inducing

a feeling of revulsion. The impulse was very strong and extremely difficult to resist. He was attracted by young men aged 18-25, and had had no heterosexual experiences. The affairs were on an emotional basis, a series of monogamous relationships, the other man usually breaking it off. He would be upset for a while, and then find somebody else. The tendency was to increasing promiscuity. The pattern was usually one of mutual masturbation, kissing, and occasional intercrural activity.

He was rated "six" on the Kinsey scale (Kinsey *et al.*, 1948).

The patient was a university graduate (I.Q. 133), had been commissioned in the Army with a good Service record. On demobilization he had taken an executive post with an oil company, but his employment was terminated owing to his known homosexuality. After this his family had set him up in a retail business, but he had mismanaged the finances to such a degree that his business was on the verge of bankruptcy.

He had been under psychiatric in-patient care previously, for three months in 1953, and he was given group and individual psychotherapy and stilboestrol. This latter treatment he described as "worse than useless," for while the drive remained he was impotent and the resulting frustration increased his homosexual desire, which was difficult to tolerate. He had spontaneously stopped taking the tablets, and continued his homosexual practice.

The present admission was via the general hospital where he had been admitted after a serious attempt at suicide by barbiturate overdose. He described his suicidal bid as an intellectual one and maintained that this was logical as his homosexual activities had started a train of behaviour which he described as "psychopathic and quite beyond control." In order to attract partners and maintain relationships it had been necessary to impress with a display of wealth. He had spent beyond his means to acquire clothes, a car, drink, etc., and in order to obtain more money and other support from the family he had found it necessary to lie repeatedly. Relations with the family had for many years become progressively more strained, and although this fact worried him a great deal and although he had excellent intellectual insight he was quite unable to do anything about it. He felt that the cornerstone of his problem was his homosexuality, and that all available treatment for this condition had failed to help him.

The theory of aversion therapy was explained to him and he was frankly sceptical, but nevertheless he agreed to undergo the treatment.

Treatment

Treatment was carried out in a darkened single room, and during this time no food or drink other than the prescribed alcohol was allowed. At regular two-hourly intervals he was given an emetic dose of apomorphine by injection followed by 2 oz. (57 ml.) of brandy. On each occasion when nausea was felt a strong light was shone on a large piece of card on which were pasted several photographs of nude or near-nude men. He was asked to select one which he found attractive, and it was suggested to him that he re-create the experiences which he had had with his current homosexual partner. His fantasy was reinforced verbally by the therapist on the first two or three occasions.

Thereafter a tape was played twice over every two hours during the period of nausea. This began with an explanation of his homosexual attraction along the lines of father-deprivation occurring at a time when awareness of homosexual attraction was not abnormal, this being reinforced by his first homosexual experiences, a learned pattern thus being established. The adverse effect of this pattern on him and its consequent social repercussions was then described in slow and graphic terms ending with words such as "sickening," "nauseating," etc., followed by the noise of one vomiting. This invariably accentuated the emetic effect

of apomorphine. After 30 hours the treatment was terminated because of acetonuria, and the patient was allowed up and about.

After a period of 24 hours the treatment was restarted with another tape, which concentrated more wholly upon the effect his practices had had on him, again ending histrionically. Again the treatment was stopped because of acetonuria, this time after 32 hours.

The following night the patient was awakened every two hours and a record played which was frankly congratulatory and which explained in optimistic terms what would have been accomplished if, in fact, his homosexual drive had been reversed. At this stage no other treatment was given and next morning the patient was allowed up and about. On each of the third, fourth, and fifth days after the apomorphine treatment had finished a card was placed in his room, pasted on to it being carefully selected photographs of sexually attractive young women. Each morning he was given an injection of testosterone propionate and told to retire to his room when he felt any sexual excitement. He was provided with a record-player and records of a female vocalist whose performance is generally recognized as "sexy."

Results

Since the treatment his whole demeanour has altered. His relatives describe him as "a new man," and his relations with them as wholly satisfactory and better than at any time in his life. He himself has felt no attraction at all to the same sex since the treatment, whereas previously this attraction had been present throughout every day. Sexual fantasy is entirely heterosexual and he soon acquired a regular girl friend. Kissing and strong petting occurs regularly, and is entirely pleasurable, in contrast with the revulsion with which he had previously regarded any heterosexual contact. In these situations he achieves strong erections and has the desire to make further sexual advances. He has ejaculated on several occasions in this situation. He no longer finds it necessary to lie or spend beyond his means. He feels generally at ease and happier than at any time since his childhood, and describes the treatment as "fantastically successful" and comments on its swiftness. In addition his hobby, writing, has been productive for the first time for very many years, and in the 20 weeks since his treatment he has written several short stories, some of which have been accepted by publishers, and has completed a full-length novel.

This is the first time in his life that he has lost his propensity to his own sex and has his sexual interests directed towards those of the opposite sex so that he has become in all respects a sexually normal person.

Discussion

Curran (1947) said "it is very easy for habit formation to occur in the sexual sphere, and the longer these habits persist the more difficult they are to break." Also, "little evidence has been put forward that intensive psychotherapy is of special value in the treatment and cure of sexual disabilities in themselves." It is only recently that the concept of learned behaviour patterns, their unlearning and relearning, has been given prominence as a therapeutic method (Eysenck *et al.*, 1960). Few reports of the method as applied to sexual abnormalities have been published.

Raymond (1956) reports a case of fetishism treated by aversion therapy, and when one considers his quotation of Binet that the form taken by a sexual perversion was determined purely by an external event, stating that "the man who can love only men could easily have been a nightcap fetishist or a shoe-nail fetishist," his reported case and the one under consideration bear many points of similarity. It would

appear that Raymond's patient underwent physiological (Pavlovian) ultraparadoxical inhibition, with the complete reversal of his former likes and dislikes as described by Sargent (1957). Our patient did not experience such a dramatic phenomenon, but it may be that he would have done so if the treatment had been more prolonged.

Freund (1960) has published a series of cases of homosexual patients treated by aversion therapy, and finds that his results vary according to the external pressure brought to bear on them before referral for treatment. Those who sought assistance because of threatened police action, for example, were the worst prognostic group, whereas those who spontaneously sought help responded most satisfactorily.

The administration of alcohol does not appear to be part of the therapeutic technique as described by Raymond or Freund. The theoretical aspects of the action of alcohol on the sexual response is discussed by Franks (1960). In the case under consideration, however, two main factors influenced its use. Firstly, although the patient was not an alcoholic, drinking was part of the behaviour pattern associated with his homosexual activity. Secondly, the consumption of alcohol under the therapeutic conditions appeared to accentuate the emetic effect of the apomorphine.

The introduction of tape recordings during the treatment was another modification of the techniques previously described. The content of the tape had been carefully composed in terms of the patient's personal history and background, in order to give the recording as personal a quality as possible.

Summary

The case is described of a 40-year-old 100% homosexual treated by aversion therapy. The results fulfil the criteria of cure as defined by Hadfield. The treatment is brief, is in no way analytical, and can be adapted to the individual patient. Although the period of follow-up is comparatively short, the patient's heterosexual attraction is increasing with time rather than decreasing, and it would be easy to give a "booster" course of treatment should he show signs of relapse. The method depends very largely on the co-operation of the patient and his desire to be rid of his homosexual feelings. In his case other methods of treatment had completely failed.

I thank Dr. Donal F. Early, consultant psychiatrist, Glenside Hospital, for permission to treat and publish this case, and express my appreciation of the way in which the nursing staff co-operated so fully in the treatment.

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Medical Memoranda

Transient Recurrent Cerebral Episodes and Aneurysm of Carotid Sinus

The occurrence of transient cerebral episodes in patients with raised arterial pressure is often regarded as a manifestation of hypertensive encephalopathy due to cerebral arterial spasm, but this concept has been questioned by Pickering (1948, 1951) and by Eastcott, Pickering, and Rob (1954).

We report here a case of recurrent transient cerebral episodes in which a diagnosis of hypertensive encephalopathy had been made. At necropsy a thrombosed aneurysm of the carotid sinus and multiple cerebral infarcts were found.

CASE REPORT

The patient was a man of 56. In 1954, at the age of 50, he complained of lassitude and breathlessness on exertion, and his blood-pressure was 190/100 mm. Hg. In 1957 his blood-pressure was 220/130, but the heart was not enlarged; the fundi and central nervous system were normal, and investigation at this time showed normal renal function. The chest film and E.C.G. showed left ventricular hypertrophy and the W.R. was negative.

On April 12, 1959, the patient had the first of his five transient cerebral episodes. His speech suddenly became guttural, slurred, and indistinct, and he found difficulty in comprehending the written word. There was no loss of consciousness, but he complained of impaired vision in the right eye. The blood-pressure was 200/130, and no localizing neurological signs were found. He recovered completely in a few days and was given reserpine 0.25 mg. t.d.s.

On August 19 he suddenly collapsed and was unconscious for four to five hours; no localizing signs were found, and the blood-pressure was 190/120. On recovering consciousness his speech was slurred, but returned to normal in the ensuing few days. After this attack he was given mecamlamine 2.5 mg. t.d.s. and chlorothiazide 0.5 g. b.d. On September 21 he had an attack similar to the first, but did not lose consciousness and recovered in two to three days. He lost consciousness for two to three hours on December 19; no localizing signs were present and the blood-pressure was 210/130. On April 1, 1960, he again lost consciousness and was thought by his family to have made convulsive movements. There were no localizing signs, but on recovering consciousness several hours later his speech was slurred and he could not understand the written word.

On April 4, 1961, he once more became unconscious and was found to have a left hemiplegia, with twitching of the right side of the face. He was admitted to the Radcliffe Infirmary, Oxford, deeply unconscious, with a flaccid paralysis of the left arm and leg and a left extensor plantar response. The left pupil was bigger than the right and reacted little to light. The fundi were normal. C.S.F.: pressure 300 mm. water; protein 170 mg./100 ml.; W.R. negative; no increase in cells. He died 24 hours after losing consciousness.

NECROPSY FINDINGS

The following were the only relevant features.

Cardiovascular System.—The heart weighed 630 g. and showed left ventricular hypertrophy. Both coronary ostia were patent. Serial 4-mm. transverse sections revealed no myocardial scarring or infarction and the coronary arteries showed atheromatous narrowing consistent with the age and sex of the patient. The aortic, mitral, and tricuspid valves showed no evidence of either old or recent vegetations,