REFRESHER COURSE FOR GENERAL PRACTITIONERS**MANAGEMENT OF THE EPILEPTIC**

BY

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The title of this article would imply that epilepsy is a unity, but this is not so. There are clinical variants of idiopathic epilepsy, excluding symptomatic epilepsy, with which we are not at the moment concerned, which differ widely not only in their pattern but in their needs for management and medical care. These must be separately considered, but it will first be profitable to discuss certain general problems, on the assumption that the diagnosis has already been made.

Management of Relatives

Idiopathic epilepsy commonly begins in childhood or early adolescence, so that the diagnosis has to be given and explained to the relatives rather than to the patient, and, as the success or failure of treatment will depend greatly upon the extent of their co-operation, the explanation must be full. They should be told that the occurrence of an epileptic attack means that there is a liability to further attacks—a liability which depends upon some innate or constitutional flaw in the brain that cannot so far as we know be eradicated. As the result of this defect nerve cells are apt to discharge in an explosive way, and this may happen at any time and usually without apparent cause. The main part of treatment will be to give medicines which counteract the explosive tendency; these must be given in such a way that so far as is possible the gunpowder is kept continuously damp. Even without treatment there may be long periods of freedom from attacks. The best medicine and the best dosage for the individual case can often be determined only by trial.

For all these reasons it is important that from the first the relatives shall take a long view of the situation, observing and recording the number and times of attacks, together with any precipitating causes, and be prepared to allow a thorough trial of each medicine or combination of medicines before it is changed. They should be warned that even if the attacks should cease it will be advisable to continue with the treatment for two to three years to ensure against recurrence. After all this, they will need some encouragement and may fairly be told that there are many cases in which the liability is so slight that it is entirely controlled by medicines and the attacks cease; that if they cease for three or four years they will probably not recur; and, further, that there are many more cases in which, though the attacks continue, they are so infrequent as to interfere very little with the patient's life, and their occurrence is known only to his intimates. It may be explained that the proportion of serious cases is small, and that one person out of every two hundred suffers from this malady in some degree.

A question often asked at this stage is whether the medicines given to prevent the attacks may damage the brain. The answer to this is no, but it should be added that some of the medicines which may be used can have the effect of making the patient dull and drowsy for the time being. Any such effect rapidly disappears if the dose is reduced, and no permanent harm can result. On the other hand, the attacks themselves sometimes have a dulling effect

on the mind, and if such symptoms should be observed care must be taken in their interpretation. They may mean that the patient is having too little medicine, not too much.

Regime for the Patient

It is important that the epileptic patient should so far as possible lead a normal life, but there are a few general rules to be mentioned.

Attacks may be precipitated by hypoglycaemia. Therefore the patient should not go too long without food. If he is to be exposed to such risk he should carry sweets or chocolate to fill the gap. Extreme hydration is another known precipitant. The ingestion of an abnormal amount of fluid at any one time should, therefore, be avoided. Attacks are apt to occur after a night short of sleep, so if the patient has a late night he should have a late morning. Excessive physical fatigue may sometimes lead to an attack and should be avoided. This does not mean that the patient must not take part in games and normal exercise, only that he should not overexert himself when untrained.

Education.—It has long been recognized by experienced clinicians and, more recently, has been shown by electroencephalographic studies that attacks are more apt to occur when the mind is vacant than when it is busy. Mental concentration therefore is good, not bad, for the epileptic, and his education should proceed normally. In view of his handicap it is even more important for him than for the ordinary person to advance his knowledge.

Avoidance of Accidents.—The risk of making the patient feel different from others must be weighed against that of accidents. The epileptic, of course, cannot hold a driving licence. If liable to attacks during the day he should not ride a cycle on crowded roads. He should not swim unless accompanied by someone who knows his disability and who can take care of him, and he should not go into a crowded swimming-bath. No other restrictions need be imposed unless the attacks are exceptionally frequent.

Diet.—Apart from the ketogenic diet, now seldom used in the treatment of epilepsy, there is no evidence that any dietetic restriction whatever has any influence upon the disease.

Drug Treatment

There are at present three drugs of standard use in the treatment of epilepsy—phenobarbitone, sodium phenytoin (sodium diphenyl hydantoinate; "epanutin"), and troxidone ("tridione"; 3,5,5-trimethylxazolidine-2,4-dione). Which of these shall be used must be determined by the clinical history, aided occasionally by the electroencephalogram (E.E.G.).

Troxidone is of specific value for attacks which exhibit the following pattern. The onset is usually in childhood; the attacks from the first are of frequent occurrence, often several times daily, and they are sudden, brief, and stereotyped. They may take the form of momentary loss of consciousness, sudden falling with little disturbance of consciousness, or myoclonic jerks of the upper limbs. Recovery

after the attack is immediate. The E.E.G. usually, but not invariably, shows the wave-and-spike form of abnormality, and is therefore a most valuable guide to the use of troxidone in minor epilepsy. This drug is made up in capsules containing 0.3 g. The suitable initial dose for patients aged 12 or older is 0.3 g. thrice daily after food. Between the ages of 5 and 12 the initial dose should be two capsules a day, and under 5 one capsule daily. The toxic effects of the drug are discussed below. Variations in tolerance may compel reduction of the dose or allow its increase if necessary.

The drug has not yet been on trial long enough for a final assessment of its value, but it would seem that in about 25% of cases the attacks are abolished, and in a further 50% they are reduced in frequency to a quarter or less, while in the remainder there is little or no improvement. In the cases which respond to troxidone improvement is generally seen within ten days. If the attacks are abolished the dosage may be gradually reduced after two months and the drug withdrawn at the end of six months if there is no recurrence. When the attacks continue despite treatment the dose should be increased and a watch kept for toxic symptoms. For patients over the age of 12 four capsules a day is usually a decisive one—this is to say, if they do not respond to this they are unlikely to respond at all. If on the maximal dose the attacks are much reduced in number and remain at the same frequency the drug should be gradually withdrawn, when it is often found that the improvement is maintained.

Troxidone is of value only for the type of attack described above (true petit mal) and may aggravate the liability to other types of attack. Combined treatment with troxidone and phenobarbitone or sodium phenytoin is necessary for patients who suffer from true petit mal together with other forms of epilepsy.

Phenobarbitone has replaced the bromides as the most effective of the sedative anticonvulsants. Its main disadvantage is that in some persons an effective dose causes drowsiness and difficulty in concentration. At first the dose should be $\frac{1}{2}$ gr. (32 mg.) thrice daily after food at 12 years or over, $\frac{1}{2}$ gr. night and morning between 5 and 12, and $\frac{1}{4}$ gr. (16 mg.) thrice daily under the age of 5. The object of treatment is, of course, to control the attacks without causing toxic effects. There is much variation in individual tolerance. For most types of attack it is best to begin with phenobarbitone and, if the attacks are not controlled, to increase the dose to the limit of tolerance; then, if necessary, sodium phenytoin can be given in addition. Many patients will tolerate 3 gr. (0.2 g.) of phenobarbitone a day without unpleasant symptoms.

Sodium phenytoin has not the sedative effect of phenobarbitone and appears rather to inhibit the epileptic discharge than protect the brain from its effects. Thus with its use the attacks may be fewer than when phenobarbitone is given but more severe when they do occur. Often, therefore, a combination with phenobarbitone is desirable. Sodium phenytoin is made up in capsules containing $1\frac{1}{2}$ gr. (0.1 g.). The average dose for a patient aged 12 or over is one capsule thrice daily if it is the only drug given. Or one capsule may be given night and morning together with phenobarbitone $\frac{1}{2}$ gr. thrice daily after food. Sodium phenytoin is also made up in capsules containing $\frac{1}{4}$ gr. (50 mg.) suitable for younger patients.

Methoin ("mesontoin"; 3-methyl-5:5-phenylethylhydantoin) has an effect comparable to that of sodium phenytoin, but in large doses is less toxic. If, therefore, there is a favourable response to sodium phenytoin but toxic symptoms make it impossible to continue with it, methoin should

be tried. It is supplied in tablets containing 0.1 g. For an adult one tablet should be given daily for a week in addition to whatever daily dose of sodium phenytoin the patient has been able to tolerate. The latter drug should then be reduced by one capsule ($1\frac{1}{2}$ gr.—0.1 g.), this being replaced by one tablet of methoin, and week by week a further exchange should be made until sodium phenytoin has been entirely replaced by methoin, which may then be increased weekly to obtain the desired effect or to the limit of tolerance. Six tablets (0.6 g.) daily is the average maximal dose for the adult, but double this amount may be tolerated by some patients.

Timing and Spacing of Drugs

The rules for troxidone have already been stated. In the use of phenobarbitone and sodium phenytoin attention should be paid to the time of day at which the attacks usually occur, and the dose should be so divided that the maximum effect is obtained at this time. For example, many epileptics are especially liable to attacks in the first hour or two after waking. Such patients should be given an appropriate dose of phenobarbitone or sodium phenytoin, or both, on waking, with smaller doses during the day. When the attacks are nocturnal only it is unwise to give the whole daily dose at bedtime, for if this is done the attacks may be inhibited during the night and appear during the day with much greater inconvenience. If, for example, such a patient is given $1\frac{1}{2}$ gr. of phenobarbitone at bedtime he should also take $\frac{1}{2}$ gr. two or three times during the day. Female epileptics may be specially liable to attacks about the menstrual period, at which time the dosage should be increased.

Toxic Effects of Drugs

With troxidone blood changes are potentially the most dangerous, either agranulocytosis or thrombocytopenia. All patients treated with troxidone should have their blood examined monthly, and the treatment should be stopped if the absolute neutrophil count falls below 1,600 per c.mm., or if there is a steep fall in the number of platelets. Acneiform, macular, or urticarial rashes may occur. Rarely there is drowsiness and slight ataxia. Photophobia in some degree is common and may require the use of sun glasses in bright weather.

Drowsiness is the most frequent toxic symptom of phenobarbitone. Severe intoxication may cause ataxia, nystagmus, and confusion. A macular rash is seen in some patients who are intolerant of the drug.

Nausea and vomiting occur in some patients if sodium phenytoin is given on an empty stomach. Rashes of an erythematous type are seen in about 5% of cases. Hyperplasia of the gums is not uncommon, but is not a serious symptom. Overdosage occasionally produces drowsiness, ataxia, and nystagmus.

An erythematous rash is the commonest toxic effect of methoin. Drowsiness occurs with overdosage.

Treatment of Status Epilepticus

Status epilepticus is not uncommonly fatal if not promptly treated. Paraldehyde by injection is by far the most effective remedy. For an adult 8–10 ml. of paraldehyde is injected into the gluteal muscle and the site of the injection massaged. The paraldehyde need not be sterilized. If the fits continue 5 ml. of paraldehyde intramuscularly is given half-hourly until they stop. The persistence of local twitching without generalized convulsion is not an indication for continuing the injections. This may last for some time after the emergency is over. If

an immediate effect is required, as in the case of a patient who has been in status epilepticus for some time and is dangerously exhausted, thiopentone may be given intravenously in a dose of 0.25 g. for an adult, followed by intramuscular paraldehyde if necessary.

Social Considerations

Choice of Occupation.—The occupation of the epileptic must be so planned that it will not involve driving a car or any other activity which will involve special risk. Occupations or professions for which a medical examination is required are generally barred. This problem must be faced early. True petit mal in young children, if not associated with any other variety of epilepsy, carries the most favourable prognosis, and when the attacks have ceased for a year or two they can be forgotten, but in the other forms the possibility of recurrence even after a long lapse has to be remembered.

Marriage and Parenthood.—No epileptic should marry unless the prospective partner has been given by the doctor a full explanation of the nature and possible course of the illness. This should be done at a private interview with the patient's written consent. The risk of transmission to offspring is serious only if there is an inherited tendency on both sides. There is evidence which suggests that a person may carry and transmit the liability without any personal or family history of epilepsy, but is then likely to show an abnormal E.E.G. A normal E.E.G. in the non-epileptic partner is therefore an additional safeguard. If the result of these inquiries is negative the risk of an epileptic having epileptic offspring is practically negligible.

Driving Licence.—The applicant for a driving licence is required to answer yes or no to the question, "Do you suffer from epilepsy?" He is instructed if in doubt to get professional advice. Supposing that the applicant, having suffered from epilepsy, has as the result of treatment been free from attacks for two or three years, what should be the professional advice? There is no provision in law which defines the time which must elapse from the occurrence of a seizure before an applicant for a driving licence may be certified as not liable to fits, so that the medical practitioner is entitled to his own opinion and is responsible for balancing the interests of his patient against the public safety. In doing so he should bear in mind that the Ministry of Transport in drawing up the regulations for driving licences were advised by a special committee of experts, appointed by the British Medical Association, that "once an epileptic, always an epileptic," and that any person who has at any time suffered from fits should be refused a driving licence, though no legal ruling was made. If therefore the doctor believes that in a particular case it would be reasonable that an application should be considered from a person who has at one time had seizures, he should give the applicant a statement to this effect with a note of the time (to the best of his belief) which has elapsed since the last attack and the date on which treatment ceased. This statement the applicant can then present to the local authority.

A.C.T.H. is now available to all the 6,572 United States hospitals registered by the American Medical Association. Previously the manufacturers of the drug had restricted the supply to about 100 research clinics and hospitals for experimental use only, but production has now increased to the point where it can be offered for sale to all approved hospitals. On May 1 the price was cut from 250 dollars (about £90) to 100 dollars (about £35) per gramme.

WORLD HEALTH ORGANIZATION

DIRECTOR-GENERAL IN LONDON

Dr. Brock Chisholm, Director-General of the World Health Organization, spoke at the United Nations Information Centre in London on October 26 on the organization and work of W.H.O. He announced that, in response to a request from the Unified Command, W.H.O. was sending five public health teams to Korea to advise on the prevention of epidemics and the restoration of the health services. The teams would work under the Unified Command initially and consist of public health officers, sanitary engineers, and social workers, the last being provided by the social department of the United Nations. Thirteen members had so far arrived in Korea, and were under the command of Dr. Walter Crichton (Great Britain).

"Contracting Out"

After describing W.H.O. services, such as the epidemiological reporting service, biological standardization, and work on an international pharmacopoeia, Dr. Chisholm drew attention to the principle of "contracting out" adopted by W.H.O. in concluding international agreements on health matters. The ratification of the old health conventions was a slow affair and some countries never did ratify them. Under the constitution of W.H.O. a time limit was set within which any country not wishing to adhere to an agreement must notify its reasons for dissenting; otherwise it was bound by the agreement.

Help to Backward Countries

Previously, help had been given to backward countries by sending out skilled teams to perform various services for the inhabitants. But when the outsiders went home "the jungle took over." Now it was recognized that the people of the country must help themselves, and that what should be done from outside was the giving of advice and provision of training facilities in more advanced countries, and the loan of specialized advisers. W.H.O. made available technical personnel who helped backward nations to study their own problems and identify their weak points. W.H.O. had provided 900 fellowships for persons to study abroad; these fellowships, awarded through Governments, covered not only medicine but nursing, hospital administration, and other related fields. There were about 100 W.H.O. fellowship students in Britain at the present time. W.H.O. also supplied medical literature to institutions in different countries.

Teaching teams were sent where they were needed. A Scandinavian team had been to Vienna to instruct surgeons in the technique of the "blue baby" operation, and a British team had been sent to Yugoslavia to demonstrate the techniques of plastic surgery developed in this country during and after the war. Clearly it would not be practicable to send comparable teams to under-developed countries. In Ethiopia, for instance, there were no indigenous doctors and no supporting professions, but there was a high rate of chronic disease. There it was necessary to build a foundation upon which a medical profession could be erected. During the past few years W.H.O. had therefore arranged for the training of nurses and sanitary workers. Two Ethiopians were now studying medicine abroad, but they were sent to study not in Europe but where they could learn in an environment appropriate to the conditions of practice in which they would have to work: they were therefore studying in the Sudan. It was no good teaching doctors and nurses from the back-villages of China public-health procedures which required three telephones on their desks.

Russia and W.H.O.

Dr. Chisholm was asked about the relationship of the U.S.S.R. and her satellites to W.H.O. He replied that at the beginning of last year the U.S.S.R., Byelo-Russia, and the Ukraine wrote letters saying they intended to leave the Organization. These letters were signed only by vice-ministers of health, and the Assembly of W.H.O. refused to recognize these withdrawals. The other Eastern European countries,