Addictions and neuroelectric therapy

A technique which can restore addicts to physiological normality within two to four weeks, based on observations of patients in Hong Kong receiving electro-acupuncture

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DRUG addiction is no longer confined to the subculture youth who hang around Piccadilly Circus waiting for their dealers to supply them with black market heroin or barbs, amphetamines or cocaine, but also includes the many frustrated, harassed or lonely housewives whose doctors irresponsibly prescribe Valium or Mogadon; or the stressed businessman who 'solves' his problems with alcohol; or the 17 million cigarette addicts in this country who have tried at least three times to stop smoking—and failed.

When anyone in these categories decides for any reason to stop using the drug or alcohol, he or she will develop 'withdrawal symptoms' which vary in severity from agonising stomach cramps and muscle pains to restlessness, anxiety and tension; occasionally in alcoholics and frequently in barbiturate dependents there are convulsions which may be fatal.

However, addicts say that the two reasons which always make them return to their drugs are first, the intense craving, both physical and psychological, which can last for years, and second, the debilitating insomnia which commonly persists for up to four months after the drug is withdrawn.

In 1972 while I was working as a general surgeon in a large Chinese hospital in Hong Kong (where there were ¼-million opium and heroin addicts in a 4 million population), a Chinese colleague, Dr Wen, a neurosurgeon, went into mainland China to learn the techniques of electro-acupuncture for his brain operations. On his return to Hong Kong, he was unaware that several of the patients on whom he was experimenting with electro-acupuncture analgesia were drug addicts until some of them volunteered the fact that, after a period of electrical stimulation by means of a stimulator connected to the acupuncture needles, their craving for heroin disappeared and any withdrawal symptoms—which were severe because of the potency of the Hong Kong mixture—that they were experiencing at the time diminished rapidly.

My Chinese colleague had little experience of drug addicts, but my husband, a journalist, had been involved in writing, broadcasting and talking with addicts of all kinds and nationalities for several years, and Dr Wen asked if we could find practising addicts for further research.

Early research

Those addicts were then offered this treatment specifically for their drug dependence and the good effects were consistently repeated. About 10 to 15 minutes after stimulation began, the patients' eyes and nose became dry; the aching, shivering and abdominal pain decreased; breathing became regular and they felt warm and relaxed. They often fell asleep under treatment and woke feeling refreshed and hungry, communicative and alert.

The good effects lasted only one to two hours at the beginning of the therapy, but for longer on subsequent days. By the 10th day of therapy, they claimed that their craving for heroin had been eliminated.

After 15 months' experimentation, it became evident that even the acupuncture needles were unnecessary and that the stimulus could be adequately transmitted transcutaneously, so I no longer called it electro-acupuncture, but neuroelectric therapy, abbreviated to NET for convenience.

The clinical results confirmed that the puncturing of the skin was unnecessary for effective treatment; further advantages were elimination of the pain from the needling and also the risks of local infection or hepatitis transmitted through unsterile needles.

At about the time of this serendipitous discovery in Hong Kong, researchers in California were demonstrating that electrical stimulation of the peri-aqueductal grey area of the rat brain produced marked analgesia—similar to morphine analgesia but without the depressive and other unwanted side-effects. These findings led me to postulate that although my application of electricity was external, the effects of treatment

Fig 1. Broadhurst Manor. The first Pharmakon Clinic will open here in January 1980

were of such a profound order, that still undiscovered factors must be involved.

The answer—or beginning of it—came in 1975 when Kosterlitz (my former tutor) and Hughes at Aberdeen University discovered enkephalin, the brain's natural pain-killer. This and similar substances since isolated have been grouped together under the generic term 'endorphins'—endogenous morphine.

Naloxone, the potent morphine antagonist, was demonstrated to be antagonist to enkephalin, as well as to the analgesia of electrical stimulation of the brain in animals and also in humans who had electrodes implanted in their brains for control of severe chronic pain.

It had also been postulated by various American researchers from Johns Hopkins and the University of California that there are receptor areas on certain cell membranes to which specific substances, both endogenous and exogenous attach.

Enkephalin and morphine both attach to the opiate receptors and it is interesting to note that enkephalin and opiate receptors are both found most abundantly in the areas of the brain which deal with pain and emotion.

My research colleagues and I further suggest that every psychoactive drug has not only its own receptor on cell membranes, but also its own endogenous equivalent; which could explain why different parameters of current in NET are required for each group of drugs.

It is also theorised that electrical stimulation produces analgesia either by stimulating the production of the endorphins, or in some way making them available for binding to their receptors. This in turn explains why analgesia produced by electrical stimulation is also antagonised by naloxone.

Heroin dependency

When a person has become dependent on heroin, production of the natural pain-killer, enkephalin, ceases because there is an ample supply of the ingested or injected exogenous drug to occupy the opiate receptors. When the heroin is suddenly stopped, there is neither exogenous nor endogenous drug available and the severe pains of the acute withdrawal syndrome ensue.

Although the acute symptoms subside within a few days, it has been demonstrated that the body does not return to physiological normality for six months in the case of heroin, and even longer in methadone (which is widely used as a replacement for heroin dependency) and barbiturate addictions.

This prolonged dysphoria is called the chronic withdrawal syndrome and is even more distressing to the addict than the acute symptoms.

The clinical evidence is that NET restores the patient to physiological normality within two to four weeks, instead of the usual six to eight months.

It has now been shown that in patients with chronic pain, lumbar-punctured while experiencing pain and again after 45 minutes of external electrical stimulation, that is, through the skin, there was a marked rise in endorphin fraction I in the CSF.

I postulate that in the addictions also, the immediate response (within 15 to 20 minutes) to NET is due to the fact that the electrical impulses cause an almost immediate re-production of endorphins or other appropriate endogenous substances. In addition, we have already demonstrated in our own laboratory research that NET causes a rapid reduction in biochemical indicators of stress.

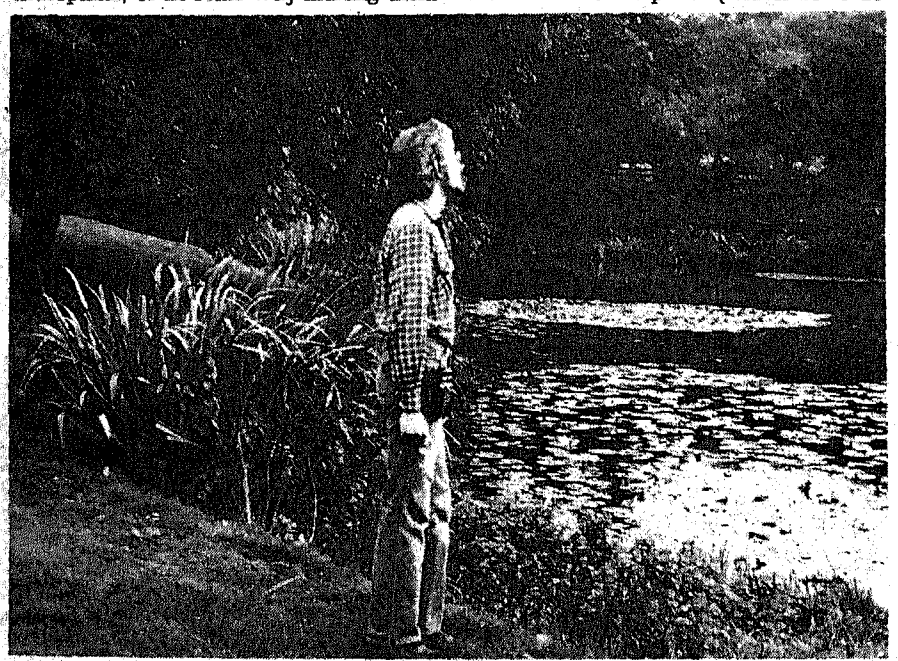

Fig 2. The Pharmakon-Patterson Stimulator in use. The patients are completely mobile while under treatment

To return to the technique of NET: at first we used a Chinese electrical stimulator, but increasingly I found this machine had an inadequate range of parameters. For example, a patient addicted to both Physeptone and Ritalin claimed that his craving for Physeptone disappeared by the third day of treatment, but that the Ritalin craving was totally unaffected. So I developed my own stimulator and in it I incorporated the several most important factors in treating drug dependencies.

This new stimulator completely relieved that same patient's craving for Ritalin. A few months ago, I developed a more selective and accurate, light-weight, pocket-size model which is worn in a small shoulder bag or hooked on to the waistband.

This transistorised machine delivers a range of current applications which remain accurate whatever the permutations, both with or without modulations of 55, 110 and 220kHz, that is, a superimposed frequency. The pulse width can be varied from 0.1 to 1.5msec, and the frequency (repetition rate) from 1 to 2000Hz (cps). Any combination can be used without altering the shape of the wave.

Addicts to narcotics and sedatives usually respond best to rectangular wave, alternating current, pulse width 0.22msec, and within the frequency range of 75 to 300Hz, 90Hz being the most effective; for cocaine and amphetamine group, 2000Hz; for barbiturates a frequency of 30 to 49Hz is used. Occasional treatments at 300 to 500Hz appear to be helpful if depression occurs. One patient who was very heavily addicted to hashish responded to 70Hz.

If there are double addictions or concomitant physical illnesses, then the problem is more complex. Several patients have coincidentally developed aversions to alcohol and/or cigarettes while being under treatment for opiate addiction.

The average current given is in the region of only 8mAmps and is, of course, completely different from ECT.

The only adverse side-effects which have been observed are occasional agitation at the higher frequencies, or, on a few occasions, nausea and headache, but these symptoms are quickly reversed by giving more treatment at a low

Fig 3. The Pharmakon-Patterson Stimulator, showing the patient adjusting the voltage (output). All the other settings are controlled by the therapist

frequency and reducing the intensity of current.

The polarity is also important and the negative electrode is attached to the left mastoid area. Two patients have stated that their symptoms recurred when the polarity was reversed. On the other hand, another two patients were convinced that the treatment was more effective when the current was reversed, and both these patients were left-handed. Further research into polarity is being conducted.

As soon as NET is begun, the drug of addiction can be completely discontinued and no replacement methadone (Physeptone), tranquillisers or sedatives need be given. One patient (who was legally prescribed 300mg of pure heroin daily) injected 900mg heroin, that is, 90 times the normal dosage shortly before she started treatment, but by using the machine continuously she did not require any replacement drugs during the withdrawal period.

It is, in fact, very important *not* to give any replacement drugs because there is strong clinical evidence that this reduces the rapidity of effect of NET. My techniques have improved markedly during the past six years and, as a result, I now rarely give any supportive drugs at all. When patients have ingested or injected narcotics or cocaine surreptitiously during a course of NET, not only are the desired effects of the illicit drugs diminished or absent, but occasionally a very severe aversive effect occurs.

If there is concomitant barbiturate use, the barbiturates are slowly withdrawn, because it has not yet been established which frequency can be relied upon to prevent withdrawal convulsions. However, two heavily addicted cases who stopped all their barbiturates without reporting this did not have any convulsions. Both patients had experienced severe withdrawal convulsions previously when unable to obtain their usual dose of barbiturates.

Rapid detoxification

There is no doubt that the rapid detoxification effected by NET is one of its major advantages. Goldstein, one of the leading USA authorities on drug addiction has said: 'It is still not understood why simple detoxification is so ineffective, but the facts are clear and inescapable . . . As I see it the reason for the dismal failure of detoxification (the majority of subjects relapse before completing the customary 21 to 30-day process) is that the newly detoxified addict, still driven by discomfort, physiologic imbalances, and intense craving, cannot focus attention on the necessary first steps towards rehabilitation, but soon succumbs and starts using heroin again'.

NET appears to release the addict rapidly from this dysphoria, and even to produce a state of optimism and calmness that enables him to look at and deal with his personal problems.

The most intractable problem in the treatment of drug dependence is the insomnia that follows the cutting off of all drugs and this is an important reason for the high recidivist rate in all present methods of drug withdrawal. The natural body rhythms have been so disturbed by drug and life-style abuse that normal patterns of sleep are non-existent. The addicts not only dread the sleepless nights but also the physical agony and intensity of craving when, if having slept fitfully, they waken in the morning.

Drug addicts claim that it takes about two months for them to regain a normal sleep pattern after coming off heroin, and three months after methadone. This has been physiologically confirmed in two daring British volunteers who made themselves heroin-dependent: even though heroin was given for only seven consecutive nights, there were abnormalities of brain function for two months after withdrawal. Some researchers claim that it may take six months or longer for various bodily functions to return to normal after withdrawal from opiates.

Likewise, in withdrawal from amphetamines, sleep abnormalities take up to two months to disappear, and in barbiturate withdrawal, up to four months. Their daytime anxieties are reflected in their nightmares during sleep. Even after a few days' administration of a small dose of Mogadon (5mg) in healthy volunteers, the sleep pattern becomes more abnormal than it was before the drug was taken, and reverts to its previous pattern only after one to two weeks.

In NET, a normal, drug-free sleep pattern is restored within five to nine days of treatment. We use flat, adhesive electrodes applied behind the ear, near the mastoid process. Electrical stimulation is given continuously for the first five days and nights, then intermittently for another five days, and if the patient can succeed in sleeping with the electrodes attached, the therapy is more rapidly effective, sleeping soon becomes restful and dreamless—instead of the usual withdrawal sleep which is filled with nightmares—and discomfort is reduced.

Patients are always extremely anxious and apprehensive on admission, and this anxiety is increased by the hospital atmosphere, which makes them feel claustrophobic. Because of this, we have developed a new concept of medical care, in the first Pharmakon Clinic (Greek *pharmakos* = drug or sorcery) which is opening in January 1980 near London. While all the necessary medical facilities will be available, these will be kept out of sight as far as possible, and the atmosphere of the Clinic will be that of an extended family home. Patients will not be allowed to stay in bed or even in their bedrooms, except by special permission, and the aim will be to keep them fully occupied throughout the day.

The nursing staff will be responsible for charting subjective and objective withdrawal symptoms four times daily for the first five days, in addition to recording pulse, temperature, blood pressure and

Fig 4. Site of electrode attachment. With this type of electrode, patients can use the stimulator throughout the night

sleeping pattern. These measurements will be part of the computerised data in our intensive research programme.

Nurses will also be responsible for changing the electrodes and ensuring that the machines are being properly used. It is hoped that in the course of time, nursing staff will also learn to adjust the parameters of current according to each patient's response to treatment.

These alterations may have to be made two or three times daily, and it requires considerable clinical acumen to know when to change the parameters and what changes to make. However, because nurses are with their patients constantly, and are specially trained in the art of observation, it is likely that nursing personnel may become more skilled in controlling the parameters of current than the doctor who sees the patient only once or twice a day.

It is important to recognise the depths of deceit that develop in everyone who is addicted to drugs or alcohol. Drug addicts, in particular, are highly skilled actors, their practice forcing them to lie and deceive convincingly for many years, and they can also feign withdrawal symptoms convincingly.

Therapists in this field must have sufficient confidence in their own clinical acumen to force the patients to look at this and other truths about themselves. Addicts despise those whom they are able to deceive, and it merely increases their fundamental despair when they are successful.

While our clinics will have the support of highly experienced counsellors for group therapy as well as individual counselling, all the nursing staff will be expected to give counsel whenever it is needed: this is required particularly in the sleepless night hours before the patient has regained a normal sleep pattern.

The Pharmakon counselling-therapy is directed towards inculcating spiritual values to help cope with the patient's former inadequacy, sense of emptiness and meaninglessness which produced the addiction.

Clinic facilities

While therapists of various kinds will be available to give specialist tuition in various activities from gardening to music, cooking to art forms, the nursing staff will be responsible for keeping the patients as fully occupied as possible throughout their waking hours. The facilities available at the first Pharmakon Clinic include tennis, a covered, heated swimming-pool, extensive formal and kitchen gardens, fishing and so on.

For the first 10 days or so, patients are generally most unwilling to participate in any activity at all, and it will be necessary for staff to work—or play—alongside the addict.

Addicts are also extremely demanding and attention-seeking: the emotional drain on all the staff will be great and they will require a considerable inner stability to withstand the strain of manipulative patients.

Because the nature of the problem of addiction includes both instructive and supportive factors, and also because so little is known about it either locally or nationally, we are setting up a counselling organisation to be known as the Befrienders Addiction Counselling Service. This will fill the present gap and when sufficient volunteers have been recruited and trained they will provide the required counselling, home and community aids, and follow-up.

The bonus of this new treatment with NET which, even including rehabilitation, can take only about two months instead of the usual up to one-and-a-half years, is that staff have the encouragement of seeing patients respond rapidly, both physically and psychologically.

The majority of patients who come for treatment have neither the desire nor intention of making a clean break with their drugs or alcohol, but if these people are shown a way of filling the emptiness of their lives when the drug is removed, then the possibility of their becoming re-integrated into constructive family or social relationships is promising.

This is the evidence which has emerged during six years of using NET, with no suitable rehabilitation available. With all the facilities and skilled staff at Pharmakon Clinics, the results should be even more impressive.

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