

NEGATIVE POLARISATION OF THE BRAIN IN THE TREATMENT OF MANIC STATES

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Introduction

CHANGES of mood and activity have been produced in normal subjects by polarising the brain with minute currents, positive polarisation giving euphoria and negative polarisation apathy and withdrawal (Lippold and Redfearn, 1964). The same authors found positive polarisation to be antidepressant in schizophrenic and depressed volunteers (Redfearn, Lippold and Costain, 1964), and subsequently in a controlled trial (Costain, Redfearn and Lippold, 1964), but these findings were not confirmed by Dawson and Montague (1965).

The only published report of the clinical application of brain negative polarisation is of its use in calming the excitement of an agitated schizophrenic (Herjanic and Moss-Herjanic, 1967). No account of its use in the treatment of mania has so far appeared, though on theoretical grounds it could be expected to have a mood-correcting action in this disorder. The following is a summary of the results of the brain negative polarisation of four hypomanic/manic patients.

Method

The apparatus used was basically that described by Redfearn, Lippold and Costain (1964) and consisted of a small box containing a 22½ volt battery and two resistors. A small negative polarising electrode was placed above the inner end of each eyebrow and an indifferent electrode just above the medial aspect of the right knee. The electrodes were covered with saline-soaked gauze and electrode jelly, and held in place by sticking plaster. Before each session the current was adjusted to the required value (250 uA) and its polarity checked with a micro-ammeter. Sessions of 2-3 hours were given two to six times per week, according to need. The treatment is unaccompanied by any sensation, and during it conversation, reading and other activities are possible.

Results

Four patients (two males and two females: age range 27-65 years), all hypomanic or manic, were treated—two in the out-patient department and two in hospital. In three, within 10 days of commencing treatment, excited behaviour and elevated mood were restored to controllable levels: in the remaining patient, a hypomanic, no marked effect was observed but she took her discharge from hospital against medical advice after only two weeks of treatment. Two of the successfully treated patients had failed to respond to large doses of phenothiazine tranquilisers; and the third contrived to avoid taking the medication. In two cases the physical condition

contra-indicated electro convulsive therapy (ECT) and in the third it was stopped after only one application because of an adverse reaction to the anaesthetic. In two cases discontinuation of the treatment was quickly followed by relapse and recommencement by improvement. The length of the courses was six months in two patients, one of whom has since been discharged to a hostel for resettlement and work and the other has died of physical causes unrelated to her mental condition. The third patient is still receiving treatment three times weekly in out-patients and is well in every respect.

Illustrative Case History

Mrs. E. S., aged 55 years, a retired midwife, was admitted informally after emergency treatment for an overdose of barbiturates taken during an argument with her husband. Recently she had been exhibiting aggressive and uninhibited behaviour, e.g. stripping herself in the street. On admission she wept bitterly. The next day her mood had changed to one of elation, pressure of talk, flight of ideas and intense over-activity.

She had been admitted to mental hospitals in 1949 and 1960 and had received out-patient ECT for depression in 1965.

Chlorpromazine failed to produce more than a slight improvement, the patient remaining elated and loquacious. She wrote numerous nonsensical letters to many famous persons. She refused ECT, and her husband supported her in this attitude. Four weeks after admission she took her discharge against medical advice.

A few weeks later her husband came to the out-patients clinic requesting ECT for her as she had remained unruly and excited. She commenced out-patient ECT but this was terminated after she became severely anoxic with the first application. She was then placed on brain negative polarisation, three sessions weekly. She made a rapid response becoming quiet and reasonable. After several months the treatment was discontinued but, as within two weeks she was again showing a tendency to undue elation, it was re-commenced with immediate improvement. She has remained quiet and docile over the ensuing five months and on 2nd January, 1969, her husband reported her to be quiet and rather withdrawn. Examination, however, failed to confirm the presence of depression so negative polarisation three sessions weekly was continued.

Discussion

As this was not a controlled trial these results must be interpreted with caution. Nevertheless, their value is increased by the fact that they occurred in a condition as relatively resistant to adventitious factors and suggestion as mania. Furthermore, that, in two cases, relapse occurred on stopping the treatment and improvement on recommencing it, suggests that the method had more than a mere placebo effect. These were patients for whom conventional therapy (ECT and phenothiazines) was either ineffective or inappropriate, so that if further work confirms these findings there would appear to be a distinct place for it in the treatment of mania, not at present covered by other methods. Manic patients are notoriously unco-operative; hence any method of treatment which can be given in out-patients and is free of the discomforts attached to other physical methods is an advantage (clearly shown in the illustrative case history).

Lippold and Redfearn (1964) suggested that the mode of action of polarisation depends upon the finding that when a negative potential is applied to the surface of the cerebral cortex, the cell processes lying near the surface become relatively negative to the more distant cell bodies (Bishop and O'Leary, 1950). This gradient is accompanied by a decrease of excitability of the cell. If the therapeutic value of the method is confirmed, such a concept would point to a promising line of investigation into the patho-physiology of psychoses with increased psychomotor activity.

Summary

Negative polarisation of the brain, previously shown to produce apathy and retardation in normal subjects, was given to four manic/hypomanic patients. In three of these a marked calming effect was noted, the fourth remaining relatively unaffected. The implications of these results were discussed and it was concluded that the method was probably effective in the treatment of this disorder and, because of facility and comfort of administration, particularly suited to the unco-operative patient.

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