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ELECTROSHOCK WITH AND WITHOUT BARBITURATE ANESTHESIA: A STUDY OF PATIENT PREFERENCE

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The purpose of this paper is to report an investigation of one controversial aspect of electroshock therapy, namely the question of whether or not patients prefer barbiturate anesthesia prior to the electrical shock.

The literature reports divergent points of view. Advocates of preshock anesthesia note: “Sedation (succinylocholine) administration must always be preceded by unconsciousness produced by pentothal, as the ringing of progressive paralysis which would otherwise be felt is terrifying” (8). Again: This anesthesia (Brivital) eliminates the awareness of the unpleasant side-effects of succinylocholine chloride, such as muscular sensations and feelings of suffocation” (9).

On the other hand, Rose (7) states that apprehensions about causing anxiety to the patient with succinylocholine alone are “groundless” provided a proper technique is used. (Rose’s technique will be described later.)

Two studies have been reported which attempted to study patients’ attitudes toward different techniques. Barker and Horpe (1) studied patient preferences to different techniques and found “...that significantly larger proportion of our patients favoured ECT given with an anesthetic.” While this conclusion cannot be regarded, a few criticisms may be directed against the method. Patients were asked to compare each treatment with the one before. If they could not remember the previous treatment, they were reminded with such words as a treatment “which you to sleep” or “without an injection.”

No tabulation was made of “no preference.” Also, the patients who received muscular relaxant without prior anesthesia received suxethionium as the relaxant. It is now believed that succinylocholine is superior to suxethionium (6).

Havens (3) studied “fear of treatment” and “tension” in completely unmodified ECT compared with ECT modified with thiopentone and succinylocholine. He concluded that there were no differences. However, the measures of “tension” and “fear” are difficult to tabulate. In neither of the two aforementioned studies were the patients unaware of the techniques employed.

From the literature it is apparent that the techniques of using succinylocholine vary widely in at least two major respects: dosage of succinylocholine and the waiting period between the succinylocholine injection and the administration of the electric shock. Those who desire complete relaxation appear to favor large doses of succinylocholine (up to 50 mg.) and wait about 60 seconds between the injection and the shock. Others advocate smaller doses (15-30 mg.) and wait 20-30 seconds.

Two articles on technique are of particular importance. Buckman et al. (2) conducted a study in which the timing of the electrical current was spaced at intervals after the succinylocholine injection. Maximum relaxation occurred about 40 seconds after the succinylocholine injection. In this study, also, a system of grading the degree of muscular relaxation was developed. Because of its practical descriptive value this system was adopted for the present study and will be described subsequently under methodology.
Rose (7) has reported a technique used in 3000 treatments with 25 mg. (females) and 30 mg. (males) of succinylecholine without barbiturates. He emphasized the timing of the electroshock treatment. He asked the patient to raise his arm at a right angle and keep it there as long as possible. When the arm began to fall, the electroshock was given. This was "usually between 5-15 seconds" after the injection, occasionally prolonged to 30 seconds. Rose states that the disagreeable choking sensation appears after the relaxation of the arm, and is therefore not a problem with his technique.

The present hypothesis was that patients would prefer ECT with barbiturate anesthesia to ECT without barbiturate anesthesia. The rationale for using an intravenous barbiturate before ECT is that the patient's apprehension at the time of treatment and his subsequent painful memories can be reduced. Kalinowsky and Hoch (8) clearly state that the addition of an anesthetic increases the immediate risk. Some clinicians are not impressed by the differences in the patient's reaction to ECT with and without barbiturates and prefer to use succinylecholine alone. Others feel that an anesthetic is indicated for all ECT, and its use should be "standardized" as part of the ECT much the same as succinylecholine has been accepted as a routine part of the ECT. The literature reviewed indicates that the problems of technique and patient comfort are controversial, and a documented study of the type proposed has not been reported.

**Method**

**Selection of patients:** Patients selected for the project were hospitalized mental patients who 1) clinically required ECT, 2) were felt to be able to communicate adequately their reactions to treatment, 3) had no physical contraindications for ECT or barbiturate anesthesia. This group included ten males and eight females whose ages ranged from 19 to 54 years, with varied diagnoses but all having depression as part of the clinical picture.

A "non-project" group of twelve patients which met the above criteria was also selected, but these patients had poor veins or entered the hospital after the project was under way. Patients for the entire study were taken consecutively and no selection was made except for the above criteria.

**Procedure:** All patients were given ECT by their own ward physicians. Some received treatment twice weekly with one day between treatments, others received treatment three times weekly with one day between each treatment. The "project" patients received treatments in pairs. One treatment in the pair was given with a barbiturate, methohexital sodium (Brevital), and the other treatment without a barbiturate. The two types of treatment were rotated randomly in succeeding pairs. A patient received atropine gr. 1/100 30 minutes prior to either type of treatment. Administration was as follows:

1) ECT with barbiturate: A syringe (10 cc) containing 100 mg. of methohexital was fitted with a three-way stopcock. The needle was introduced into the antecubital vein and the barbiturate injected slowly until the patient was unconscious, as judged by loss of responsiveness to questioning. This was produced with 60-100 mg. (average 75 mg.) of Brevital. A syringe containing 20 mg. of succinylecholine chloride (Sucostrin) was then attached to the stopcock and the entire 20 mg. was rapidly injected. After 30 seconds an electroshock was applied bi-temporally using a Medcraft machine with Glissando technique and a voltage of 160 at 0.5 seconds. (This voltage and time were selected as standard since they were felt to be above the seizure threshold of any patient. It was not necessary to alter the voltage or time for any patient during the study.) During the course of each seizure the degree of relaxation was evaluated by a method proposed by Buckman et al. (7).

2) ECT without barbiturate: The "project" patients also received the same technique they received no barbiturate only succinylecholine, treatment.

The "non-project" patients also received the same technique they received no barbiturate only succinylecholine, treatment.

The project patient was not aware that differently treated patients had not directly reported about the project did not know which patients were patients. The data were collected for males and females. The interviews had been designed to be brief interviews to ascertain patient's preference. They were asked which patients were patients. The physician introduced that he was conducting patient's preference study. He further stated that
sions but all having depression as the clinical picture.

The "non-project" group of twelve patients met the above criteria was a little different, but these patients had poor relatives and no selective except for the above criteria.

where: All patients were given ECT in their own ward physicians. Some received treatment twice weekly with an interval of a month between treatments, others received treatments three times weekly with one day between treatments. The "project" patients received treatments in pairs. One patient in each pair was given succinylcholine (Brevital) while the other received no barbiturate. In both methods in any given pair, he did not necessarily receive the barbiturate and succinylcholine in the same sequence for successive pairs. A 10 mg. of atropine was given 15 minutes prior to either type of treatment. The patient was unconscious as judged by a loss of normal posture.

ECT with and without barbiturates

The same technique was utilized except that the first syringe contained 10 cc. of normal saline.

The "project" patients were started alternately on these two methods. Although each patient received treatment by both methods in any given pair, he did not necessarily receive the barbiturate and succinylcholine in the same sequence for successive pairs.

The "non-project" or control group of patients also received treatments in "pairs." The same technique was utilized except that they received no barbiturate or saline, but succinylcholine, 20 mg., for each treatment.

The project patients were apparently aware that different techniques were being used for alternate treatments. This information was not directly reported, and "ward gossip" suggested that the project did not develop.

The data were collected by two clinicians, one for males and one for females. The interviewers had no contact with patients except for brief interviews after each treatment of the pair to ascertain each patient's preference. They were "blind," i.e., did not know which patients were "project" or "non-project" patients, and had no knowledge of which technique was used in a given treatment. With each patient the interviewer introduced himself and indicated that he was conducting a survey concerning patient's preference and reactions to ECT. He further stated that he knew that the patient had had two treatments within the past several days which had been administered by his ward physician; the patient's preference for either treatment, if any, was assessed. No patient indicated that he felt that different techniques (in terms of medication received) accounted for his preference. All patients were interviewed on the day following the last treatment of the pair since it was felt that memory impairment was minimal at this time.

RESULTS

Of the 47 treatment pairs administered to the 18 "project" patients there was "no preference" in 24 pairs (51 per cent), preference for barbiturate in 19 pairs (40 per cent) and preference for succinylcholine alone in four pairs (8.5 per cent). Of the 24 pairs administered to 12 "non-project" patients, no preference was reported in 16 (67 per cent). In eight pairs (33 per cent), however, there was a stated preference for one treatment over the other even though the treatments were identical. (See Figure 1.)

DISCUSSION

The most striking finding is that in half the pairs when electroschock was administered with and without barbiturates no preference" was expressed. The findings in the control group suggest that, in these circumstances, patients tend to express some preference about one-third of the time even when there is no difference. When preferences are expressed, they are in favor of succinylcholine over succinylcholine alone, although these preferences are mild.

There appear to be at least three explanations of the present finding that the patients' preference for barbiturate anesthesia ECT is a mild one.

First, the dose of succinylcholine might not be sufficient to induce respiratory paralysis. This dose of succinylcholine, however, was sufficient to produce a satisfactory degree of general muscular relaxation. Util-
lizing the scoring method of Buckman et al., the modal relaxation for males was found to be ++ and for females +++. Second, there is always the possibility of interviewer bias in assessing the patient preferences. Some protection against this source of error was afforded by having the interviewers “blind” and by their knowing that all patients interviewed were not project patients. The results obtained by the two interviewers are sufficiently similar to lend confidence to results.

A third possibility comes from the fact that the electroshock itself usually causes sufficient retrograde amnesia to obliterate memory of the brief unpleasant sensations of the respiratory paralysis. When the patients were interviewed the day after electroshock they displayed no gross memory defects, but it is here proposed that it is the amnesia for events immediately surrounding the electroshock which minimizes the stated preference for the barbiturate method.

The data have been examined to see if such common variables as age, sex and diagnosis might be related to preference for barbiturate anesthesia. These findings were negative, as was the supposition that a patient’s choice in the first pair would influence choice on subsequent pairs. “Individuality” however does play a role of the patients account for 15 of the stated preferences for barbiturate anesthesia. The other twelve patients had an equal opportunity to contribute to “barbiturate preference” but did so only for times. It would be intriguing and important to determine what distinguishes these patients, but that aspect is not discernible in this study. The present findings have been interpreted to mean that physicians should not feel under obligation to use preshock barbiturates as a routine procedure, rather on an individual basis. Further data on this question are now being gathered using another method, namely the assessment of preshock anxiety in a series of treatments with and without barbiturate anesthesia.

SUMMARY

Eighteen patients on electro-convulsive treatment who received treatment with and without barbiturates were evaluated with regard to their “preference” using a double-blind technique and a control group. Over half the time the patients had no preference for one technique over the other. If a preference was expressed, it was that patients would avoid barbiturate treatment.

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