The Effects of ECT Modifications on Autobiographical and Verbal Memory

Walter F. Daniel, Herbert F. Crovitz, Richard D. Weiner, and Helen J. Rogers

Electroconvulsive therapy (ECT) produces memory impairment which remains an area of controversy. There have been suggestions that more amnesia may follow sinusoidal than brief-pulse ECT because more total electrical energy is delivered by the former than the latter treatment modality. However, these effects are examplified in the present investigation.

In the present investigation, the effects are examined on memory for a specific autobiographical episode. Several investigations have revealed that personal information inventories are sensitive means of assessing ECT-induced amnesia. However, to date, no investigation has examined the effects of the electrical stimulus wave form on memory for autobiographical information.

Supported by the Medical Research Service of the Veterans Administration. The opinions expressed herein are those of the authors and do not necessarily represent those of the Veterans Administration or Duke University Medical Center.

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MEDICAL RESEARCH SERVICE, VETERANS ADMINISTRATION

INTRODUCTION

Electroconvulsive therapy (ECT) produces memory impairment which remains an area of controversy. There have been suggestions that more amnesia may follow sinusoidal than brief-pulse ECT because more total electrical energy is delivered by the former than the latter treatment modality. However, these effects are examplified in the present investigation.

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Table I. Autobiographical Memory as a Function of Electrode Placement and Stimulus Wave Form

<table>
<thead>
<tr>
<th>Treatment Modality</th>
<th>Bilateral</th>
<th>Unilateral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sine pulse</td>
<td>Sin = 3</td>
<td>Sin = 4</td>
</tr>
<tr>
<td>Pulse</td>
<td>Puls = 1</td>
<td>Puls = 4</td>
</tr>
</tbody>
</table>

- Autobiographical memory present?
- Yes: 0, 0, 4, 3
- No: 3, 4, 1, 1

DISCUSSION

The results obtained in the present investigation indicate that ECT will reduce the efficacy of autobiographical memory as measured by the procedure outlined. However, it is not evident whether this effect is specific to autobiographical memory or whether it is a more general phenomenon affecting memory in general. This is an area that requires further study.

Sinusoidal stimulation did not produce significantly greater autobiographical or verbal amnesia than did brief-pulse stimulation. Other studies have reported more amnesia following sinusoidal than pulse stimulation, but these studies contain the following serious methodological inadequacies: failure to establish statistical significance for alleged intertreatment amnesic differences (Medlicott, 1948; Epstein and Wender, 1956; Valentine, 1968), confounding of results by postictal confusion (Medlicott, 1948; Valentine, 1968), failure to specify whether patients were oxygenated (Medlicott, 1948; Kendall, 1956; Valentine, 1968), and intertreatment differences in hypoxia (Epstein and Wender, 1956). Our study contains none of these methodological inadequacies, and no statistically significant effect of stimulus wave form on memory functions was observed.

Regarding electrode placement, our results are consistent with other reports of greater retrograde amnesia following bilateral than unilateral nondominant ECT e.g., Lancaster et al., 1958; Cannicott and Waggoner, 1967; Costello et al., 1970; d'Elia, 1970; Weiner et al., 1982. However, this is the first investigation to demonstrate a statistically significant greater impairment in memory for autobiographical episodes following bilateral than unilateral nondominant ECT.

The forgetting of an autobiographical episode is not a trivial phenomenon. Similar ECT-induced autobiographical memory failures, if added across a course of ECT, may produce gross autobiographical memory gaps that may be disconcerting to a patient and a patient's family, because the patient's sense of continuity with his or her own past may be disrupted. It is not yet known how long-lasting this effect is. Further study is necessary to determine the extent to which autobiographical memory deficits extend. Nor is it known whether low-energy brief-pulse ECT will reduce these deficits. Further research is needed to clarify these issues.
in a Psychiatric Population: A Preliminary Study

Glucose-6-Phosphate Dehydrogenase Deficiency

Brief Report

Suhayl I. Nasr, Edward Altman, Gordon Pscheidt, and Herbert Y. Meltzer

Glucose-6-phosphate dehydrogenase (G6PD) is the rate-limiting enzyme of the hexose monophosphate shunt. Deficiency of G6PD is a recessive X-linked metabolic disorder. Erythrocytes are particularly affected, but other tissues have also been found to be deficient in this enzyme. G6PD deficiency may result in hemolytic anemia, particularly after the ingestion of certain drugs, fava beans, or after conditions of stress like bacterial infections. Hemolysis has also been known to occur following exposure to pollen. It is estimated that this enzyme deficiency affects around 100 million people around the world, but only recently has it been known to occur in Cohen administration hospitals. It has been suggested that this deficiency may result in a high risk of Huntington's disease. The G6PD defi ciency also appears to be associated with certain drugs, which may be noted in the following sections. G6PD deficiency has been reported to be associated with some psychiatric disorders. However, the association between G6PD deficiency and psychiatric disorders is still under investigation.