The Effects of ECT Modifications on Autobiographical and Verbal Memory

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

INTRODUCTION

ECT produces memory impairment which may be modified by a choice of stimulus electrode placement (bilateral vs. unilateral) or electrical stimulus wave form (sinusoidal vs. brief-pulse). Regarding electrical stimulus wave form, it has been suggested 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. Several investigations have revealed that personal information inventories are sensitive means of assessing ECT-induced amnesia. To date, however, no investigation has examined the effects of the above on memory for a specific autobiographical episode. To date, however, no investigation has examined the effects of the above on memory for a specific autobiographical episode. The effects of these modifications on memory for a specific autobiographical episode are examined in the present investigation.
Table II. Autobiographical Memory as a Function of Electrode Place 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>1</td>
<td>4</td>
</tr>
<tr>
<td>Sinusoidal Pulse</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Autobiographical memory present?
- Yes: 0
- No: 3

**Discussion**

The results of the study indicate that bilateral ECT, compared to unilateral ECT, produced greater retrograde amnesia. Similarly, 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 brief-pulse stimulation, but these studies contain the following serious methodological inadequacies: failure to establish statistical significance for alleged intertreatment amnestic differences, failure to specify whether patients were oxygenated, failure to control for intertreatment differences in hypoxia and treatment number, and intertreatment differences in treatment spacing.

Our study is the first to demonstrate a statistically significant greater impairment in memory for an autobiographical episode following bilateral than unilateral nondominant ECT. The forgetting of an autobiographical episode as simple as having heard the Airplane List before ECT is not a trivial phenomenon. Similar ECT-induced autobiographical memory failures, if added across a course of ECT, may produce cross autobiographical memory gaps that may be disconcerting to a patient and a patient's family, because the patient's sense of continuity with the patient's own past may be disrupted. It is well known that the effects of ECT on memory are not uniform, and a patient's memory function may differ as a function of treatment history. The forgetting of autobiographical episodes as simple as hearing the Airplane List before ECT is a significant phenomenon. ECT produces retrograde amnesia, and our results are consistent with other reports.

Regarding electrode placement, our results are consistent with other reports of greater retrograde amnesia following bilateral than unilateral nondominant ECT. However, this is the first study to demonstrate a statistically significant greater impairment in memory for an autobiographical episode following bilateral than unilateral nondominant ECT. The forgetting of an autobiographical episode as simple as having heard the Airplane List before ECT is not a trivial phenomenon. Similar ECT-induced autobiographical memory failures, if added across a course of ECT, may produce cross autobiographical memory gaps that may be disconcerting to a patient and a patient's family, because the patient's sense of continuity with their own past may be disrupted. It is well known that the effects of ECT on memory are not uniform, and a patient's memory function may differ as a function of treatment history. The forgetting of autobiographical episodes as simple as hearing the Airplane List before ECT is a significant phenomenon. ECT produces retrograde amnesia, and our results are consistent with other reports.

**References**

Glucose-6-Phosphate Dehydrogenase Deficiency

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 mainly blacks, Mediterraneans, and Sephardic Jews.

Following the report of two black men with G6PD deficiency who developed transient psychosis following the administration of primaquine sulfate, G6PD deficiency was surveyed in hospitalized chronic schizophrenic patients. These studies showed no association between G6PD deficiency and psychosis, but these are questions about the diagnostic and assay reliability used in these studies. Heller et al. (1979) studied sickle cell disease and G6PD deficiency in over 65,000 admissions to Veterans Administration hospitals. They also found no correlation between G6PD deficiency and any psychiatric disorder.

Supported in part by USPHS NH 30938. HYM is recipient of RSFCA 47808. This work was done when all the authors were with the Illinois State Psychiatric Institute Laboratory of Biological Psychiatry.

Received February 1, 1982

Study I. Ness, Edward Alan; Gordon Pecnik, and Herbert V. Meltzer.

Brief Report

In a Psychiatric Population: A Preliminary Study

Glucose-6-Phosphate Dehydrogenase Deficiency

Daniel Citron, Weisen, and Rogers