Academically-focused cognitive rehabilitation supports cognitive-linguistic recovery in college-bound adults with brain injury

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BACKGROUND

• Young adults are a frequently-affected and growing population to suffer acquired brain injury (ABI).1,2
• Skills important for success in college (e.g., attention, language) are often impaired after ABI, making participation difficult.3,4
• Limited cognitive rehabilitation (CR) services for young adults with ABI interested in college are available within the current continuum of care.5,6

PRIMARY AIM

• Do young adults with ABI demonstrate significant improvements in cognitive-linguistic function over the course of multiple 12-week semesters of ICCR?

METHODS

Demographic information

<table>
<thead>
<tr>
<th>Age</th>
<th>MPO</th>
<th>Etiology</th>
<th>Sex</th>
<th>Edu. Level</th>
<th>Pre-tx WAB</th>
<th>Pre-tx RBANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICCR students (n=12)</td>
<td>25.9 (3.9)</td>
<td>TI</td>
<td>58.3</td>
<td>33.1</td>
<td>TBI = 7</td>
<td>Stroke = 4</td>
</tr>
<tr>
<td>Control participants (n=6)</td>
<td>25.4 (3.9)</td>
<td>TI</td>
<td>60.8</td>
<td>45.4</td>
<td>TBI = 4</td>
<td>Stroke = 2</td>
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</tbody>
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Note: Mean (SD); MPO = months post onset; Edu. Level = Education Level; TBI = Treatment Pre-tx WAB = Aphasia Quotient (out of 100; higher score = less severe); Pre-tx RBANS = Total Index Score (Standard Score: Mean = 85; SD = 15)

Selected Assessments

• Western Aphasia Battery - Revised (WAB)11
• Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)12
• Scales of Cognitive and Communicative Ability for Neuropsychiatric Status (SCCAN)13
• Discourse Comprehension Test14

RESULTS

Composite Scores

<table>
<thead>
<tr>
<th>RESULTS</th>
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<tbody>
<tr>
<td>ICCR Program</td>
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<tr>
<td>METHODS (cont’d)</td>
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<tr>
<td>Sample Weekly Treatment Schedule</td>
</tr>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>10:00</td>
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<td>11:00</td>
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Other Activities

• Take quizzes & cumulative exams
• Receive individual SLP training for specific skill training

Note: – 300 hours/semester; Typically 6 students in the class. May attend multiple semesters of the program until they are ready to transition to post-secondary education

Data Analysis

• Linear mixed effects regression models were performed separately for each participant group and assessment measure:
  • Dependent Variable: Accuracy on the assessment measure
  • Independent variables:
    • Fixed factors: Semester & Total N of semesters (covariate)
    • Random factor: Participant (intercept)

Note: Checkmark = statistically significant change over time

CONCLUSIONS

• On all six cognitive-linguistic assessments, ICCR students’ scores significantly improved as the number of semesters in ICCR increased, indicating a cumulative benefit of the program.
• ICCR students also demonstrated significant longitudinal gains across a range of cognitive-linguistic domains (e.g., attention, memory, naming).
• Overall, fewer significant changes were observed in the active delayed treatment controls over time, suggesting ICCR resulted in the experimental participants’ gains.
• This study expands and confirms our previous work10 supporting the efficacy of ICCR for improving cognitive-linguistic functions important for college success.
• Further, it builds upon the growing evidence base showing the benefits of intensive rehabilitation for improving cognitive-linguistic function in individuals with ABI.15
• As this program’s structure incorporates principles of neuroplasticity,8 future work should examine the brain reorganization underpinning these longitudinal gains.

REFERENCES


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