

Effectiveness of cognitive rehabilitation in TBI-evidence from clinical trials

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Objectives

The primary objectives of this project are to demonstrate that: 1. Systematic categorization training, the Categorization Program (CP) is an effective method to improve categorization abilities in patients with moderate-severe TBI. 2. Post-acute rehabilitation is beneficial to patients with moderate to severe TBI as evidenced by improved functional outcome and neuropsychological performance.

Hypotheses

1. Post acute rehabilitation will result in improved functional performance in TBI.
2. Patients receiving the CP training will improve categorization abilities to a greater degree than TBI controls.
3. Patients receiving the CP training will demonstrate generalizability of new skills to new tasks as compared to TBI controls.

Participants

This project involved participants who sustained moderate to severe TBI and were enrolled in post-acute rehabilitation. Two groups of subjects with moderate-severe TBI (experimental $n = 20$, and control $n = 15$) and one group of non-injured normal subjects ($n = 16$) were included. Participants with TBI were randomly assigned into the experimental or the control group and were matched on critical variables and severity indices. There was no difference between TBI participants in pre-tx performance on dependent measures such as the Mayo-Portland Adaptability Inventory (MPAI-3), the Community Integration Questionnaire (CIQ), or any of the other neuropsychological measures used in the project.

The experimental TBI group received systematic categorization training as part of a clinical trials project testing the effects of the Categorization Program. TBI subjects in the control group did not receive the CP training; instead they received cognitive tasks traditionally used in their facility. Subjects were monitored in order to receive similar amounts of cognitive treatment. Subjects received about 12 weeks of post-acute rehabilitation; they were assessed before rehabilitation and at the end of their treatment.

Methods

The experimental TBI group received the CP training. TBI subjects in the control group did not receive the CP training; instead they received cognitive tasks traditionally used in their facility. Subjects were monitored in order to receive similar amounts of cognitive treatment. Subjects received about 12 weeks of post-acute rehabilitation. Subjects were assessed before rehabilitation and at the end of their treatment. The dependent measures for the analyses were the two functional outcome measures (MPAI-3 and the CIQ), the CP Test 1, the CP Test 2, and the three probe tasks.

Results

MANOVA yielded significant gains on total post CIQ for both groups ($p = .0001$). Pairwise t -tests showed significant changes on the 3 subscales for the experimental group. TBI controls only improved in Productivity subscale. MANOVA on the MPAI-3 resulted in significant improvement for both groups on all subscales. Experimental subjects performed significant

better on the categorization tests, CP 1 and CP 2 at the end of the study ($p=.017$, & $p=.011$). Also, TBI experimental subjects improved across the 3 probe tasks ($p=.006$). Control Subjects didn't show improvement on the probe tasks indicating difficulty in generalizing ($p=.888$).

Conclusions

Subjects enrolled in post acute rehabilitation demonstrated improvement in functional performance. However, those who received the CP training demonstrated greater improvement on categorization skills and on certain aspects of functional cognitive abilities. Regarding categorization tasks, the performance of experimental subjects approximated the baseline performance of normal subjects on some tasks. In contrast, TBI subjects in the control group did not show significant improvement on categorization abilities. Furthermore, subjects in the experimental group demonstrated the ability to implement their new skills in solving new problems as evidenced in the significant improvement during the probe tasks. TBI subjects in the control group did not show this type of improvement. The study supports the use of the systematic categorization training in post acute rehabilitation. In addition, the study supports the efforts of post-acute rehabilitation in general because it facilitates functional recovery after brain injury.

References

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