Brain Outcome After Cardiac Arrest- Single Case Experimental Design Intervention Study

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Abstract

The survival rate of out-of-hospital cardiac arrest (OHCA) patients has increased over the past decades. This gives rise to a growing number of patients with hypoxic-ischemic brain damage and cognitive impairment. Currently, there is a lack of knowledge regarding effectiveness of treatments to improve outcomes of patients with cognitive impairment after a cardiac arrest. The primary objective is to test effectiveness of cognitive rehabilitation therapy to improve functioning on problematic well-defined personalized behaviour that is caused by an objective cognitive impairments after OHCA.

This is a randomized multiple baseline single case experimental design (SCED) intervention study. Four to six patients who survived a cardiac arrest and with cognitive impairments will be included in this study. There will be a baseline phase, an intervention phase, and a follow-up phase. The intervention will consist of a combination of direct training of the impaired cognitive function(s) and metacognitive strategy training. The subjective personalised cognitive problem will be measured on a daily basis via an app. Next to this primary outcome variable, objective- and subjective cognitive functioning will be measured with neuropsychological tests and questionnaires respectively. MRI-scans (DTI) will be made

before and after the intervention to explore the relationship between baseline structural brain integrity and cognitive recovery. It is expected that during the baseline period, the objective and subjective problems with cognition remain stable. When the intervention has started, a decrease in the subjective daily problems is expected. After the intervention is implemented an improvement on the objective cognitive tests and subjective questionnaires is expected. We hope to see that these improvements are mainted during the follow-up period of 3 months. A correlation between improvements in cognitive functioning in structural or functional connectivity between brain areas is expected. It is hoped that a combination of direct training and metacognitive strategy training will improve cognitive functioning of patients with cognitive impairment after OHCA.

Keywords: Single case eperimental design (SCED), cognitive therapy, cardiac arrest