Efficacy of a Computerized Program of Cognitive Rehabilitation of Attention in People with Acquired Brain Injury (ABI): Pilot Study

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STUDY PROTOCOL

1.1 Screening tests

Short attention test (BTA); (D. Schretlen, 1989). The test is used as a measure of divided attention. It can be used in people between 17 and 82 years, it is of individual application with an approximate duration of 10 minutes (D. Schretlen, Bobholz, & Brandt, 1996).

Trail Making Test (TMT A-B); (Reitan & Wolfson, 1985). The test is used to evaluate attention, psychomotor speed, cognitive flexibility, visual search and executive functions (Fernandez, Marino, & Alderete, 2002).

Test of Colors and Words (Stroop Test); (Stroop, 1935). It provides information on the inhibitory capacity of the subject and its resistance to stimulus interference (Stroop, 1935).

Symbol and digit test (SDMT); (Smith, 2002). It is a test that involves the conversion of geometric designs into written and / or spoken numerical responses. The test is applied from 8 years to 78 and can be individually or collectively. Because the test consists of geometric figures and numbers, and these are universal symbols of written language, the SDMT test is relatively free of cultural and idiomatic factors and can be applied in different countries and languages (Smith, 2002).

PASAT test is a measure of cognitive function that evaluates the speed and flexibility of the processing of auditory information, as well as the ability to calculate (Fischer, Jak, Kniker, Rudick, & Cutter, 2001).

Bells Test. The Bells Test (Gauthier, Dehaut, & Joanette, 1989) is used to detect visual inattention in children and adults and it consists of a 21.5 × 28 cm sheet of paper on which seven lines of 35 distractor figures (e.g., bird, key, apple, mushroom, car) and five target figures (bells) are presented. The target figures are arranged so that five of each appears in seven equal columns on the page. A study of 576 healthy French subjects between the ages of 20 and 80 years conducted by Azouvi et al. (2002), considered a difference of 1 omission between the right and the left side as normal (95th percentile), and a difference of 5 as pathologic (5th percentile). Time

for completion of the test was also analyzed, with a time longer than 183 subjects considered abnormal (normal mean time = 105 s). The group also considered the difference between right- and left-handers as not significant.

Attention Test D2 is a cancellation task that evaluates the basic processes of selective attention and mental concentration. This instrument also reflects three components of attentional behavior: the speed or amount of work, the quality of work and the relationship between speed and accuracy of care (Brickenkamp, 2012).

Minimental State Examination (MMSE), is a short and quantitative measurement that can be used to detect cognitive deficits, to assess its severity at a given time, to follow the course of cognitive changes over time and to evaluate the response to a treatment. Several investigations have shown that the MMSE is a reliable and valid instrument in different patient samples and the general population (Folstein, Folstein, McHugh, & Fanjiang, 1975).

1.2 Study of cognitive functioning

The following neuropsychological tests will be used to obtain information before the implementation of the intervention, after its implementation and at 6 months. The cognitive domains to evaluate will be: attention, memory, visuoperceptive skills, executive functions, processing speed and language. All the tests have scales for the Spanish population. Each of them is briefly described below:

Hopkins Verbal Learning Test - Revised (HVLT-R; Benedict, Schretlen, Groninger, & Brandt, 1998). It is one of the most used tests to measure learning and verbal memory in the neuropsychological clinical evaluation. It consists of a list of 12 words extracted from 3 different semantic categories (Benedict et al., 1998).

Test of the complex figure of Rey (Rey, 2009). It is a very useful instrument to evaluate the perceptual organization and visual memory in people with brain damage, evaluate the ability to organize and plan strategies for problem solving, as well as the viso-constructive capacity (Cortés, Galindo, & Salvador, 1996).

Modified test of classification of Wisconsin cards (M-WCST; Nelson, 1976; Schretlen, 2010). It is a variation of the Wisconsin Card Classification test created to assess abstract reasoning and the ability to adapt cognitive strategies to the changing

environment. It is an individual application test for adults between 18 and 90 years and between the administration time and score add approximately 12 minutes (Nelson, 1976).

Boston Denomination Test (BNT; Goodglass, Kaplan, & Barresi, 2005). The test consists of naming 60 sheets presented in order of difficulty. Its test-retest reliability coefficients are above 0.77 (del Toro et al., 2011; Pedraza, Sachs, Fernan, Rush, & Lucas, 2011) and has demonstrated good internal consistency with indexes greater than 0, 78 (Pedraza et al., 2011).

Phonological and Semantic Verbal Fluency Test (Benton, Hamsher, & Sivan, 1994). These types of tests are highly sensitive to brain damage, so they are commonly administered to people with neurological damage (TBI, multiple sclerosis, dementias, etc.) (Henry & Crawford, 2004; Strauss, Sherman, & Spreen, 2006). These tests require the person to be flexible, organize the information and exercise inhibition when necessary.

European Brain Injury Questionnaire (EBIQ; Sopena, Dewar, Nannery, Teasdale, & Wilson, 2007). It is a self-report that gives us a relative measure of the subjective experience of the cognitive, emotional and social difficulties experienced by people with ABI.

1.3 Study of the attentional state in the patient's daily life

Questionnaire of attention problems. This is a questionnaire prepared by the department's research team for this project with the objective of obtaining a measure of how attention problems affect the activities of the patient's daily life, said questionnaire consists of 7 questions, one of them multiple choice.

Moss Attention Rating Scale (MARS;Whyte et al., 2008). It is made up of 22 items, through which an observational rating of the behaviors related to care is obtained. It is useful in evaluations of people with TBI (moderate - severe) (Whyte et al., 2008).

1.4 Study of the emotional state of patients

Several questionnaires will be used before and after the implementation of the program, as well as at 6 months to measure behavioral aspects, quality of life, satisfaction with life, patient functionality and subjective experience of social, emotional difficulties. and cognitive.

Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001). This is a 9-item questionnaire that evaluates the presence of major depressive disorder based on the criteria of the diagnostic and statistical manual of mental disorders (DSM-IV-R). Difference between other depressive symptoms, positive depressive symptoms and negative depressive symptoms (Baader et al., 2012).

Generalized Anxiety Disorders Scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). This is a 7-item scale that evaluates the presence of generalized anxiety disorder based on the criteria of the diagnostic and statistical manual of mental disorders (DSM-IV-R). The scale has been adapted to Spanish (García-Campayo et al., 2010).

1.5 Quality of life study

Quality of life scale (SF-36; Ware & Sherbourne, 1992) consists of 36 questions through which the quality of life related to physical and emotional health, the interference of physical and emotional problems in social life is evaluated, the degree of vitality, energy or fatigue and the general perception of health.

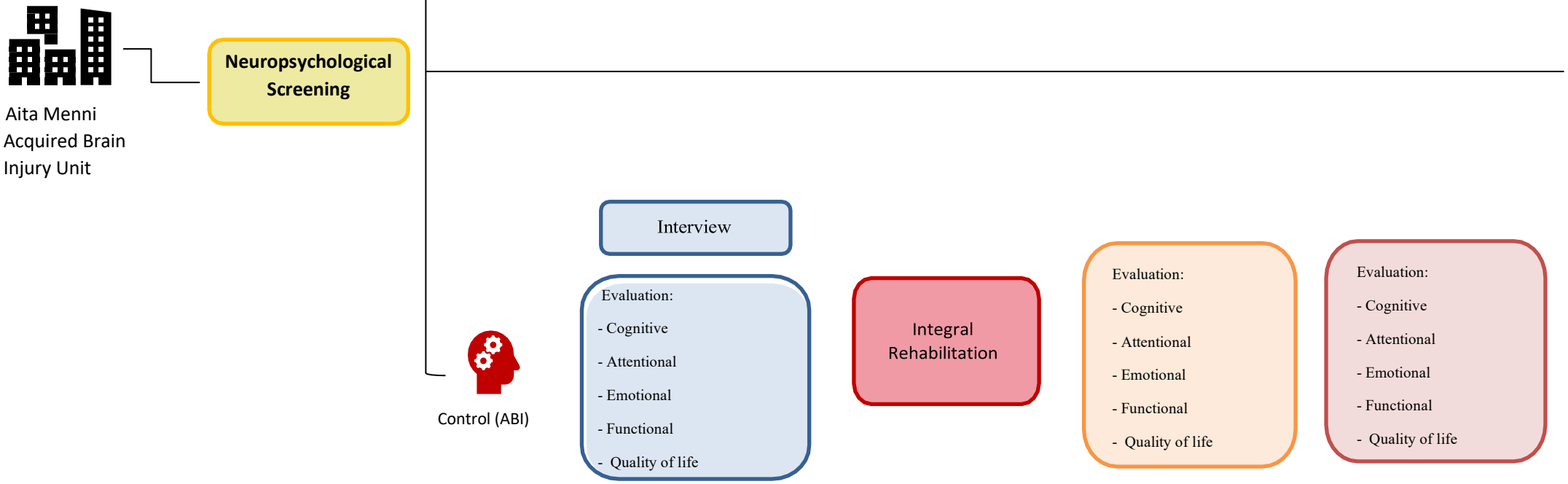
Life Satisfaction Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). It is a global measure of satisfaction with life that consists of 5 items. Different studies have used this scale for the evaluation of life satisfaction of people with TBI (Corrigan, Bogner, Mysiw, Clinchot, & Fugate, 2001).

1.6 Study of functional status

Disability Rating Scale (DRS). It is an instrument that evaluates functional recovery in patients with moderate and severe traumatic brain injuries from coma to their return to society, taking into account cognitive function (Wright, 2008).

2.Working plan

Information will be obtained from each participant at three specific times: before the implementation of the intervention (screening and baseline: Phase 1), after the end of the intervention (Phase 2) and 6 months after the end of the intervention (Phase 3). Next, each of the stages and the tests that would be administered are detailed.


Aita Menni
Acquired Brain
Injury Unit
Neuropsychological Screening
Experimental (ABI)
Interview
Evaluation:
- Cognitive
- Attentional
- Emotional
- Functional
- Quality of life
Integral Rehabilitation + NeuronUp APT
Evaluation:
- Cognitive
- Attentional
- Emotional
- Functional
- Quality of life
Evaluation:
- Cognitive
- Attentional
- Emotional
- Functional
- Quality of life
Control (ABI)
Interview
Evaluation:
- Cognitive
- Attentional
- Emotional
- Functional
- Quality of life
Integral Rehabilitation
Evaluation:
- Cognitive
- Attentional
- Emotional
- Functional
- Quality of life
Evaluation:
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