



Neuropsychological Rehabilitation in Chronic Obsessive-Compulsive Disorder. About a Case

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DOI: 10.31080/ASNE.2023.06.0689

Received: September 14, 2023

Published: November 27, 2023

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Abstract

Introduction: Exposure with response prevention (RPE) has shown efficacy, although not all patients benefit in the same way. There are people who abandon, or do not understand the fundamentals of it, being unable to overcome the scenes presented in therapy, because they erase the information.

Although the scientific literature has proliferated on the cognitive aspects that are altered in OCD, there are numerous controversies.

Objective: Explore in a chronic patient the different neuropsychological and clinical aspects in order to apply a more comprehensive and effective treatment.

Results: Prior to neuropsychological treatment, the patient presented alteration in executive functions (processing speed, inhibitory control, cognitive inflexibility mainly) and alteration in visuoconstructive praxis, all in line with what was found in the scientific literature. Slight improvements were obtained in the affected parameters after one year of treatment (two sessions per month of neuropsychological rehabilitation), however they favored the application and continuity of exposure and prevention of response and reduction of depressive symptomatology by withdrawing the autolytic ideation from which it started.

Conclusions: Neuropsychological rehabilitation (NB) could constitute the previous step to the intervention by Clinical Psychology (CP) of exposure and response prevention (RPE) in the psychotherapeutic treatment of OCD.

Keywords: Neurocognitive Disorders; Obsessive Compulsive Disorder; Neuropsychological Tests; Cognitive Tests; Cognitive Behavioral Therapy

Introduction

Obsessive-compulsive disorder (OCD) is characterized by obsessions and compulsions (actions aimed at neutralizing the onset of obsessions) [1]. This causes great discomfort due to the investment of time in the rituals and can generate functional disability [2]. Epidemiologically it is considered the fourth mental disorder in order of prevalence [3-5].

4 dimensions of OCD have been identified: pollution, unacceptable thoughts, symmetry and order and tendency to

hoard objects [6]. A multifactorial study has suggested that the dimension of responsibility for harming others should be taken into account more than the dimension of hoarding [7].

Lavage symptoms are associated with increases in activation of the insula, inferior frontal, and parahippocampal regions [8]. There are numerous studies that find no association between these dimensions of OCD symptoms and performance in neuropsychological tests [9].

Meyer developed a specific treatment called “exposure with response prevention” (RPE) being the specific treatment for OCD with the most efficacy studies [10,11].

Some patients do not seem to benefit from the technique, since they do not manifest progress, refuse the intervention or have only intrusions without performing behavioral or mental rituals [12,13].

From the work of McFall and Wollersheim, cognitive techniques begin to be incorporated into the EPR, trying to increase its effectiveness [14].

Neuropsychology and OCD

Several authors have shown that there are symptoms associated with a dysfunction of the cortical thalamus striatum CSTC [15,16].

Hyperactivation of the orbitofrontal cortex and frontosubcortical pathways of OCD occurs, due to a feedback imbalance [9,17].

The involvement extends to the dorsolateral prefrontal cortex, the parietal cortex, and its connections to the frontal structures [18]. This model predicts alterations in executive functions with the frontostriatal system [19]. Other authors speak of an aberrant hyperactivation of the frontostriatal circuit [20]. Frontostriatal circuits are neural pathways that connect regions of the frontal lobe with the basal ganglia (striatum) that mediate motor, cognitive, and behavioral functions within the brain [21].

This frontostriatal network serves to promote executive functions, including inhibition, planning, phonetic verbal fluency and cognitive flexibility [9,22,23].

VP processing speed

The concept of obsessive slowness was already described in 1974 by Rachman. It has been studied with the subtests of Digits and symbols of the Weschler intelligence scale (WAIS) and Trail Making Test (TMT) part A [24,25]. Other measures such as the GNG Test and the Stroop test have revealed that VP is altered in patients with OCD [25-27].

MT working memory

TM is crucial within executive functions, and the two subdomains are often explored: verbal TM and visuospatial TM [9]. Worse performance is observed in patients with OCD compared to non-psychiatric patients.

Memory

Although there are studies that demonstrate reduction in verbal memory, the conclusion is that in OCD, there are no deficits analyzed in two meta-analyses [28,29].

Visual memory has been extensively investigated with the Rey-Osterreich complex figure test (ROCF [30]). This test measures visuospatial skills. After 20 or 30 minutes the patient must reproduce the drawing, without having it in front of him. The results show that there is poor performance in both parts of the test (copy, and recall) in individuals with OCD [31].

Visuospatial skills

They are usually measured with the ROCF in the copy part of the figure, and only a few studies show that OCD patients run altered [32,33].

Is treating incipient OCD the same as chronic OCD?

“Treatment-resistant” OCD involves those patients who do not respond to treatment with at least two therapeutic trials with SSRIs [34]. The term “treatment-refractory” would imply a higher degree of resistance, defined by not responding to a certain number of therapeutic trials with SSRIs, pharmacological augmentation strategies (with atypical antipsychotics normally), and little or no response to psychotherapeutic treatment with CBT [35].

In a diagnosis of chronic OCD, RPE may be insufficient, the PC must know the fundamentals of neuroscience, and the neuropsychological models that are behind behavior, emotions and feelings.

Faced with a description of the hierarchy and an application of it, clinicians may feel that the evidence does not hold up.

We found several altered neuropsychological functions in line with numerous investigations on OCD [9]. Although scientific literature has proliferated on the cognitive aspects that are altered in OCD [13], there are numerous controversies. We wanted to explore the different neuropsychological aspects in order to apply a more comprehensive and effective treatment.

Why is exposure and response prevention efficient in OCD patients?

There are many meta-analyses that support the efficacy of RPE even three years after the end of treatment [36].

Comparison of RPE with other treatments, in randomized controlled studies to experimental conditions, indicates that it is more effective than anxiety control training or pharmacological placebos [37,38]. tag. 60-80% improvement with CBT, in a reduced period of four weeks, in addition, the improvement of symptoms ranges between 50-80%. CBT has shown decreased brain activity in certain brain areas: thalamic activity, right caudate action, and orbitofrontal area [39].

Washing OCD results better than in other types of obsessions [40].

Finally, it should be noted that the presence of OCD comorbidity would reduce the efficacy of RPE [36].

We studied whether there is a common pathophysiology between OCD and major depression, with (positron emission tomography). They showed decreased glucose metabolism and blood flow in the left dorsolateral prefrontal cortex, caudate nucleus, compared to control-normal subjects [41].

Endophenotypes

A number of neuropsychological functions and neurobiological markers have been proposed to be candidates in TOC endophenotypes with fMRI functional magnetic resonance imaging. Hypoactivation of the orbitofrontal cortex is observed in OCD patients and their unaffected relatives, suggesting that it could be an OCD endophenotype. Cognitive inflexibility and deficits in motor inhibition could also be an endophenotype of OCD, because they were also present in the sample of OCD patients and their unaffected relatives [42,43].

Material and Method

Patient

A 66-year-old patient presents to the RHB department in the context of the RHB protocol for cardiac surgery. Onset of OCD at age 25, after death (his main attachment figure). Abandoning psychological treatment repeatedly. It presents contamination subtype.

Psychopharmacological treatment: olanzapine, paroxetine, lormetazepam and lorazepam.

Inventories and/or Questionnaires

- **Yale Brown Obsessions and Compulsions Scale (Y-BOCS):** Measures the intensity of obsessions, compulsions, and types of OCD. [44].
- **Maudsley's Obsessive Compulsive Inventory (MOCI):** The MOCI collects the 30 items with four scales that integrate it: Cleaning, Checking, Slowness and Doubt. The score obtained reflects the amount of time an individual spends on symptoms [45].
- **Test of colors and words Test Stroop:** It allows to evaluate the phenomenon of interference, closely linked to inhibitory control processes [46].

Frontal Assessment battery FAB Measurement of frontal lobe functions [47].

- **Weschler III Word List Wechsler memory scale:** (Subtest Word List) to assess immediate recall, delayed recall and recognition. It can be applied between 16 years and 89 years and 11 months [48].
- *Complex figure of King Osterrieth* [30].
- **Trail making Test A and B [49]:** It is a test that consists of two parts and measures functions of the frontal lobe
- **Overlapping images of the Barcelona Test:** Integrated neuropsychological examination programme [50].
- **Wisconsin Card Sorting Test:** WCST This test consists of 64 cards with figures that vary in shape, color and number. The participants must learn at all times the rules of the game, in such a way that they are able to match the present card with one of the four possibilities [51].
- **Beck Depression Inventory [52]:** It assesses the severity of depressive symptomatology in adolescents and adults using 21 multiple-choice questions.

Application of the treatment

The treatment chosen was RPE. This technique consists of facing the feared object or idea, either directly or through imagination, following the scientific evidence [53].

We offer the possibility of CBT (RPE), within the context of family therapy and cardiac surgery prehabilitation protocol.

We elaborate hierarchy of highly anxiogenic situations and topographical analysis of rituals.

From the beginning, there is a deficit of understanding in the objective of treatment. We also introduced a mindfulness exercise, as an anxiety reduction technique for him to practice at home.

The patient continued without overcoming the scene overcome in previous sessions, and brought new scenes. The process of generalization was evident. We struggled in describing the scenes of the hierarchy, but the patient did not understand.

When the exposure began, he could not descend into subjective units of anxiety, until we proceeded to explain to him again, that the mechanism of anxiety.

After 4 sessions the patient is able to reduce their anxiety levels in the different anxiogenic scenes, although cognitive distortions characteristic of depressive thinking are observed although it is verified that their anxiety has decreased, analyzing the records.

We proceeded to evaluate the patient neuropsychologically, due to the tendency not to encode the material presented verbally.

After evaluation NP presented (alteration of executive functions, visuocognitive praxis, verbal working memory, slowing in VP), being included in a group of DCA, for one year, with 2 sessions of cognitive stimulation per week.

Alteration of the frontoparietal and frontostriatal systems in the patient.

Neuropsychological rehabilitation treatment

Rehabilitation of executive functions:

Sohlber and Mateer's program for dysexecutive syndrome [54,55] that affects three areas:

- Selection and execution of cognitive plans
- Time control
- Self-regulation of behavior

Sohlber and Mateer Attention Process Training Program [54,55]. It is a hierarchical conceptualization when it comes to stimulating the different types of attention, hierarchized by their level of difficulty: Training in sustained, selective, alternating and divided attention [55].

Memory rehabilitation

Program PQRST (Preview, Question, Read, State, Test) [55]. Studies show that although when applying this program the immediate memory is not very favored (there are no significant differences) in the long term if it is effective because the material worked is improved.

Stimulation and rehabilitation of gnosis and visuospatial abilities.

Application of Exposure and Prevention Response

- The rationale for exposure and the anxiety response is reexplained.
- The patient is able to overcome the newly selected scenes.

Results

Yale Brown Scale. The patient obtained a total score of 28 at the beginning of treatment, placing him at a severe level. After global treatment, it is at an average level with a score of 15.

Mausdley scale, improvements in the scales in Washing, doubt and awareness, going from 7 to 3 remaining unchanged after finishing the treatment.

Complete figure of Rey-Osterreich

In the copy before treatment we found a slight alteration, not obtaining benefit with NB, observing a decrease in its performance with a scalar score of 4. As for the recall of the task, only a slight improvement was observed. Figure 1.

Stroop paradigm

It improves slightly in PV, although it has become more resistant to interference from external stimuli, after NB program (Figure 5). The control of interference is a cognitive mechanism, which allows the control of automatic tendencies. In terms of working memory measured by letters and numbers of the WAIS, the patient improves after rehabilitation.

Improvement was observed, with the Weschler Memory test mainly in total recall score and recognition (Figure 3).

Wisconsin task classification test. He was only able before and after treatment to complete a category with 128 attempts, although there is a decrease in perseverative and non-perseverative errors

after neuropsychological treatment and an increase in the number of correct answers. (Figure 4).

Slight improvement in GNG tasks and conflicting instructions. (Figure 2).

No alterations in denomination.

Improvements in depressive score eliminating autolytic ideation.

Discussion

We believe we have achieved certain goals, such as reducing OCD symptoms from 25% to 35%.

We still have to clarify the relationships that occur between the frontostriated condition and the clinical symptoms of chronic OCD patients and what pathways favor pharmacology and different psychotherapeutic treatments.

Within the neuropsychological affectation we support what Simon proposes [55], that the study of cognitive processes is necessary in order to establish relationships between the neuroanatomic base, clinical symptoms and cognitive functions.

Our study is consistent with the deficits in cognitive flexibility criteria measured with the WCST and in the number of perseverative errors [57,58] according to the scientific literature (Figure 4).

The phonetic verbal fluency found at the beginning and end of treatment does not shed light on the controversial results present in the different studies [59].

The Stroop test, a difference is observed between the verbal component being at the medium level and the color component (isolated from verbal influence) being more affected both at the beginning and at the end of the treatment. We observed some congruence of reduction results in the VP [26,27] Together with some deficit in GNG tasks, improving their performance at the end of the NB. Improvement in MT (measured with letters and numbers) and GNG tasks (measured on the FAB scale). Figure 5.

Our patient scores below the average in subtest of letters and numbers, our result being consistent with those of Krishna., *et al.* [60].

In visuospatial skills, we have obtained results in line with what was found in other studies [61] both at the beginning of rehabilitation treatment and at the end of it, observing deficiencies in performance. Although there are authors who justify the impoverishment of the ROCF, due to alterations in the processing speed [62] we believe that we must continue investigating this transversal executive function in order to see if it is what explains the deficits found.

Due to the low sample size, based only on an in-depth case study, we cannot generalize the results and further investigation of these processes is needed.

CP should include neuropsychology in the diagnosis and treatment of OCD.

We can consider that it constitutes the previous step to the development of what is successfully described in the scientific literature such as “the EPR”.

It might be interesting to consider the possibility of prescribing neuropsychological treatment prior to exposure with response prevention in chronic cases.

Conclusions

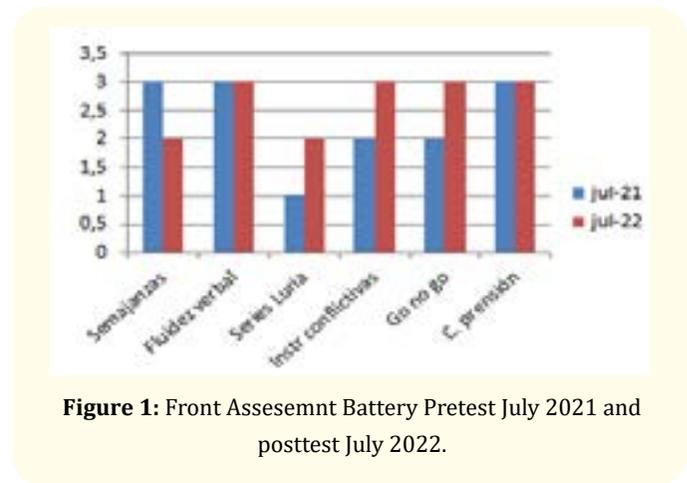


Figure 1: Front Assesemnt Battery Pretest July 2021 and posttest July 2022.

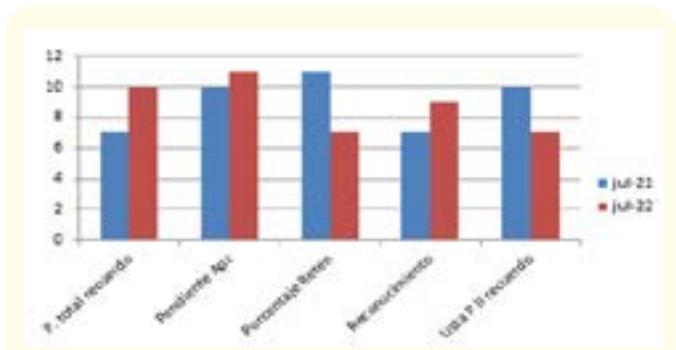


Figure 2: List of words Test Weschler III Pre test July 2021 and post-test July 2022.

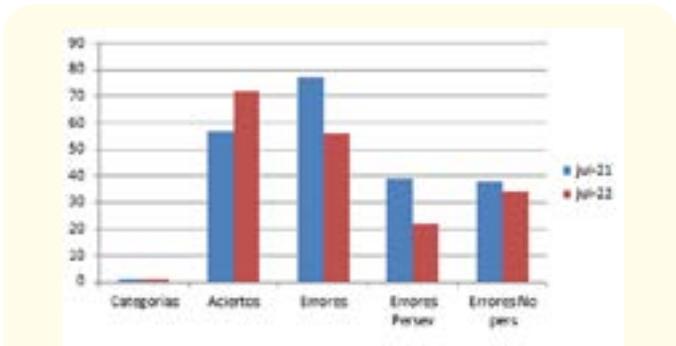


Figure 3: Wisconsin Card Classification Test (WCST) Pretest July 2021 and posttest July 2022.

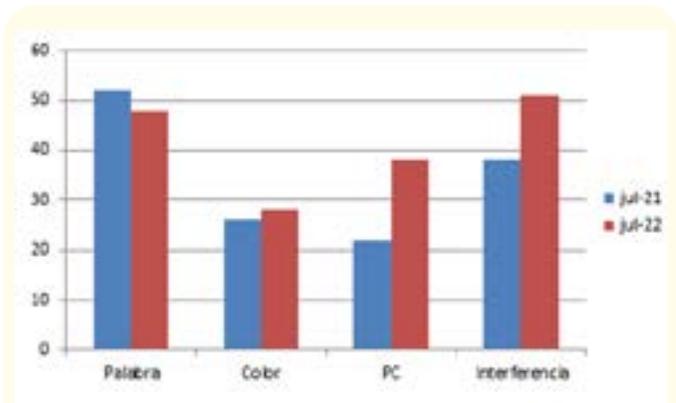


Figure 4: Stroop Test Pretest July 2021 and posttest July 2022.

	Evaluation July 2021	Evaluation July 2022
F. King's Complex-Osterrieth copy	Pe 7	Pe 4
F. King's Complex-Osterrieth Remembrance	Pe 2	Pe 3
Front Assesent Battery FAB	14/18	16/18
WAIS number key	On the 7th	On the 8th he omits 3
WAIS letters and numbers	Pe 4	On the 11th
WAIS digits	Pe 10	Pe 8
TMT A	Pe 2 with 109''	Pe 2 with 85''
TMT B	3 correct steps	5 correct steps
BDI Beck Depression Inventory	21 with autolytic ideation	8 without autolytic ideation
Overlapping images of the Barcelona Test	19/20	18/20 to
Categorial evocation of animals Test BCN	14	15
Phonetic fluency BCN Test	30	29

Table 1

There are currently many models that explain OCD, being the neurobiological model of the cortico-striatum-thalamus-cortical circuit, the one that offers the most empirical support [15,17,56].

The NB is a necessary tool to promote improvement and recovery in moderately chronic patients of OCD. The exploration of neuropsychological aspects should constitute the previous step to the development of what is successfully described in the scientific literature such as "exposure and response prevention".

Our results coincide with the type of endophenotype found (cognitive inflexibility and deficiency in motor inhibition) [43].

NB helps to meet the requirements of RPE in chronic patients.

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