Neuropsychological functioning of a patient with organic personality disorder

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Dear Editor

Organic personality disorder (OPD) is characterized by the presence of disinhibition produced by an organic alteration affecting behavior and cognitive domain functions, especially the executive ones. This work analyzes the neuropsychological deficits of a male patient with OPD and their possible relationship with his high levels of disability. The assessment of the patient evaluated with the WAIS-III showed that his global intellectual capacity was significantly below the mean. Furthermore, deficits in attention, short and long-term memory and executive functions were observed. The findings could be consistent with a general alteration of the executive functions which, in turn, could be affecting the patient's ability to self-regulate his actions and responses. Based on the previous data available for the patient, a possible deterioration in the general intellectual functioning was observed. The current deficits of the patient, evolution and a consideration of the neuropsychological alterations, as predictors of the functionality, could explain his difficulties. A rehabilitation intervention based on learning metacognitive strategies within a context that made it possible to transfer that learned to daily situations was proposed. An intervention within the framework of a comprehensive intervention and that the neuropsychological study would considered a key piece in the rehabilitation process of the patient with OPD is recommended.

Introduction

Organic personality disorder (OPD) is one of the most frequent psychiatric consequences associated to traumatic brain injury (TBI).[1] OPD, according to the tenth edition of the international classification of diseases[2] (ICD-10), is characterized by a significant alteration of the usual patterns of premorbid behavior. Expression of emotions, needs and impulses are especially affected. Cognitive functions may principally or exclusively have deficits in the areas of planning and the foresight of the personal and social consequences of the behavior. It should be mentioned that the presence of cognitive deficits in this clinical category have been associated to higher levels of disability.[1] In spite of its recognition within the field of psychiatry, research in this regards is still limited.[3]

This work studies the neuropsychological deficits of a patient with OPD and their possible relationship with the patient's functional problems.

Case description

Identification of the patients and history of the problem

The patient is a 32-year old male who has been living in the psychiatric residence since January 2012. He is the second of two brothers, did not finish secondary school, has no work experience and is incapacitated. His mother is his legal guardian. He has a 65% disability certificate with grade I and II dependence. There is no known individual psychiatric history or any data that indicate significant development alterations or problems.

In 1993 at 13 years of age, the patient suffered a TBI, with a score of 7 on the *Glasgow Coma Scale*. This score indicates the presence of severe or serious head injury[4] and the patient was in coma for one month. The study showed necrotic lesions on the right temporal level in the area of the callous body and demyelinization areas in the middle line, ventricular dilation and frontal hygromas of right predominance. He was hospitalized for three months (one month in the pediatric intensive care unit and two months in the ward). After this, he was transferred to the family home, with outpatient neurological control of the evolution of the TBI. He recovered without motor sequels but with isolated episodes of transient diploplia due to temporal pallor of both optic nerves. No other sensory lesions were observed. He also had significant problems in impulse control.[5,6]

In 1995, he was discharged from outpatient neurological follow-up, with the recommendation to undergo psychiatric control and follow-up in his reference Adult Mental Health Center. In this same year, the WAIS was administered to him with the following results: Verbal intelligence quotient (VIQ)=90; Manipulative intelligence quotient (MIQ)=75; Total intelligence quotient (TIQ)=86. The patient was administered the following psychopharmacological treatment: carbamazepine (1000 mg/day), risperidone (6 mg/day) and sertraline (150 mg/day). He was diagnosed of OPD secondary to TBI in accordance with the ICD-10 diagnostic criteria.[2]

In 1998, he was admitted for the first time to an acute psychiatric unit because of marked aggressiveness and impulsiveness after his father's death. He was in the hospital for approximately 3 weeks. In 2001, after several hospital admissions, he was admitted to a subacute unit because of

family problems to establish limits and control disruptive behaviors. In 2007, he was transferred to a middle/long stay hospitalization unit due to sexual aggression in compliance with a court order that expired in April 2012. As stated in his clinical record and in the unit registries, his improved sexual adaptation was observed in the patient's evolution. There was also improvement in his management of the ability to accept and overcome frustrations and decrease of impulsiveness. However, the patient frequently showed impulsive behaviors and difficulties in instrumental activities of daily life (activities aimed at interacting with the environment). For example, problems were observed to become involved in the center activities. His attendence was iregular and with disruptive behaviors when he did attend.

Current situation

In the last six months, the patient's functioning has deteriorated. He has high levels of disability: total score of 17/20, according to the semi-structured interview *Disability Assessment Schedule Short Form* (DAS-s).[7] He demonstrates severe difficulties to carry out daily activities such as personal care (DAS-s score=3), occupation (DAS-s score=5) and family (DAS-s score=5) and social relations (DAS-s score=5) in which verbal and physical behavior of aggressiveness are seen. A psychiatric examination was performed using the semistructured interview Positive and Negative Syndrome Scale for Schizophrenia[8]. The following results were obtained: Positive subscale=9/49; Negative subscale=16/49; General psychopathology subscale=41/112; Total scale=66/210. The patient was oriented in time and space, with limited disease awareness about current and past moments. He did not admit to having a mental disease or the need for treatment. Restless behavior and concern for feelings and thoughts that were generated internally were also observed. His thoughts were rigid, and stereotypal and he had difficulties to perform classifications and generalizations. Presence of psychiatric psychopathology that would be interfering significantly with the patient's functioning was ruled out. A neuropsychological evaluation was requested to establish the degree in which the cognitive deficits could be interfering in his functioning.

Neurological evaluation

A neuropsychological battery including the assessment protocol of the psychiatric residence in which the patient was staying was administered. Table 1 shows the neuropsychological battery used, the order of administration of the different tests and the sessions performed. The examination results are shown in table 2.

Wechsler Adult Intelligence Scale, third edition: WAIS-III[9]

The purpose of this scale is to evaluate general intellectual functioning.[10]

Table 1 Sessions, tests administered and order of administration

Session	Neuropsychological tests administered
First	1. WAIS-III: Matrix reasoning subtest
	2. RAVLT
	3. TMT part A and B
	4. RAVLT delayed recall
	5. S-VFT
	6. WAIS-III: picture completion subtest
	7. WAIS-III: vocabulary subtest
Second	8. WAIS-III: Digit symbol subtest
	9. WAIS-III: Similarities subtest
	10. WAIS-III: Block design subtest
	11. WAIS-III: Arithmetic subtest
	12. WAIS-III: Digit span subtest
	13. WAIS-III: Information subtest
	14. WAIS-III: Picture Arrangement subtest
	15. WAIS-III: Comprehension subtest
Third	16. WAIS-III: Symbol search subtest
	17. WAIS-III: Letter-Number sequencing subtest
	18. CPT
	19. ROCF

WAIS-III: Wechsler Adult Intelligence Scale for adults, third edition; RAVLT: Rey Auditory Verbal Learning Test; TMT: Trail making test; S-VFT: Semantic verbal and phonemic fluency test; CPT-II: Conners' Continuous Performance Test; ROCF: Rey-Osterrieth Complex Figure

His total verbal intelligence quotient, manipulative quotient and verbal comprehension indexes, perceptual organization and working memory were 2 to 2½ standard deviations below the mean of a normative group. Thus, his abilities measured by this IQ and indexes are within the very low range. His information processing speed index is within the normal-low range, compared with its normative group.

The patient has significant problems to form concepts, analyze and synthesize information, reason with visual and verbal stimuli, and to use language as a means of communication and learning. His greatest problems are found in his capacity to distinguish essential details from non-essential details, in the stimuli presented and in temporal retention of verbal and visual information, while the processing or operating with it.

Conners Continuous Performance Test-II[11]

This test makes it possible to evaluate the capacity to maintain attention (vigilance) during the performance of a task with limited cognitive burden.[10]

His elevated number of omission errors manifests important difficulties to attend to the stimuli and to

Table 2	Results of the examination	
WAIS-III	**Intelligence Quotient**	**Intelligence Quotient indexes**
	Verbal = 61 Manipulative = 69 Total = 62	Verbal comprehension = 61 Perceptual organization = 69 Working memory = 70 Processing speed = 81
CPT-II	**T scores**	
	Omissions = 125 Commissions = 42 Measure of hit reaction time = 61 Standard Error = 79 Variability = 82 Detection of stimuli (d') = 40 Response style (ß) = 64 Perseverations % = 45	
RAVLT*	**Direct score**	**Percentile**
	Trial 1 = 7	71
	Trial 2 = 7	34
	Trial 3 = 5	4
	Trial 4 = 2	< 0.01
	Trial 5 = 2	< 0.01
	Total words recalled = 23	2
	Post-interference recall = 2	< 0.01
	Delayed recall = 1	< 0.01
ROCF**	**Percentile**	
	Copy type I = 75 Quality of copy = 40 Copy time = 50 Memory type I = 75 Memory quality = 10	
TMT***	**Percentile**	
	Part A = < 1 Part B = 2	
FAS**	**Direct score**	**Percentile**
	Total words evoked = 10	< 0.01

WAIS-III: Wechsler Adult Intelligence Scale -third edition; CPT-II: Conners' Continuous Performance; RAVLT: Rey Auditory Verbal Learning Test; ROCF: Rey-Osterriech Complex Figure; TMT: Trail making test; FAS: Semantic and phonological fluency test (PVF).

*Evaluated according to Geffen et al. scale (1990)26; **Evaluated according to Rey scale (1987)13; ***Evaluated according to Tamayo et al. scale (2012)27; ****Evaluated according to Álamo et al. scale (1999)28

Note. It was not possible to use scales from the Spanish sample for the correction of the RAVLT test. There is no information that it has been standardized and published in our country.

discriminate them. His responses are slower and erratic when the interval between stimuli is lengthened and as the test advances. This indicates problems in the ability to adjust to the changes in the demands of the task and many difficulties to maintain attention.

Rey Auditory Verbal Learning Test[12]

This is a test that makes it possible to evaluate short term memory, long term memory and auditory verbal recognition memory.[10]

His learning curve decreased as the task progressed. There was a significant decrease in number of words correctly reproduced after the third test. The number of words remembered was two standard deviations below the mean of the normative group. This indicated low capacity for storage, recovering and reproducing verbal information in the short term. Recall and recovery of short and long-term verbal member was clearly affected, both for interference from other verbal stimuli and if there was no interference.

Rey-Osterrieth Complex Figure[13]

This test evaluates skills for graphomotor reproduction skills in the reproduction of an abstract figure, organization and planning ability, and short-term visual memory.[10]

The patient started by drawing the figures, both as a copy and by reproducing it by memory, beginning with the central rectangle as the framework, and including and adding other elements of the copy. This type of reproduction is the most frequent after 15 years of age. The time used in the copy was within the normal range (percentile=50). The quality of the copy (accuracy and richness of the details) was normal. The quality of the memory reproduction was very low compared with his normative group, which shows difficulties in the recall and reproduction of visual stimuli (short term visual memory).

Trail making test[14]

The trail making test makes it possible to evaluate visual tracking, graphomotor skills, sustained visual attention and some executive functions (sequencing, mental flexibility and planning).[10]

The patient's performance was two standard deviations below the mean according to his normative group in part A and B of the test. His performance of the task was slow and his visual tracking of the stimuli irregular. He frequently lost his focus of attention, especially in part B of the test, which significantly harmed performance and maintenance of the correct sequences. He presented many difficulties in the visual tracking, sustained visual attention, sequencing, planning and cognitive flexibility.

Semantic verbal and phonemic fluency test[15]

The purpose of this test is to measure the executive functions, capacity to search for and recover a series of words that fulfill certain requirements in long term memory.[10]

The patient's performance was more than 3 standard

deviations below the mean for his normative group. Many difficulties were observed in the capacity to access the verbal information, evoke and recover it from the long term memory.

Discussion

The results of the evaluation performed on the patient showed that his global intellectual capacity was low compared with the normative group and specific neuropsychological deficits. The patient experienced difficulties in his ability to maintain his attention, in short-term verbal and visual memory, in long-term memory and in some executive functions (sequencing, mental flexibility, planning, organization and problem-solving).

The results on the WAIS administered to the patient in 1995 showed that his global intelligence capacity was within the low normal range. However, there were statistically significant discrepancies between his verbal abilities, within normal range, and perceptual-visomotor and spatial abilities, which were in the low range according to his normative group. It is possible that his cognitive abilities which were developing when the TBI occurred were subjected to significant interference.[16] No data are available because no studies were made until 1995. The conditions under which the subject was evaluated in 1995 are also not stated in the clinical records. Therefore, the reliability of the data available is also not stated. The results of the current intelligence study with the WAIS-III showed harmonic scores (TIQ=62; VIQ=61; MIQ=69) and all of them were at more than two standard deviations below the mean of his normative group. There is a significant decrease in his verbal ability, sequencing and knowledge acquired scores, these having fallen 29 points, almost two standard deviations. There is also a decrease in his perceptual-visomotor and spatial abilities, although less (less than ½ standard deviation). This manifests a possible deterioration in intellectual functioning. Although no data are available on his premorbid intelligence functioning, there is nothing in his clinical records to indicate that his ability was below normality. Possibly, the deficits in his ability to maintain attention and in short and long term verbal memory are interfering with his capacity for understanding and verbal expression, reasoning and learning. These findings could be consistent with a general alteration of the executive functions which, in turn, could be affecting the capacity of the patient to regulate his actions and responses internally.[17]

At the time when the patient was administered the neuropsychological test, he was receiving psychopharmacological treatment (risperidone 6 mg/day, sertraline 150 mg/day and carbamazepine 1000 mg/day). It was ruled out that the risperidone,[18,19] sertraline[20] and carbamazepine[21] and their interaction[22] were causing major cognitive side effects. The neuropsychological battery used for the evaluation of the patient formed a part of the evaluation protocol of the psychiatric residence where the patient was staying. Although the protocol used included different evaluation scales, it did not allow for a comprehensive evaluation. For example, the protocol includes tests for the evaluation of the executive functions recommended in patients with TBI, such as the TMT, VFT,[16,17] the figure of Rey[10] or the CPT.[17] However, a more comprehensive evaluation of some of these functions, that is inhibitory control, planning and ability to learn from errors, for example, would be recommendable.

The scope of the deficits of the patient and their evolution could explain his functioning difficulties he has.[1] It is of note that this is a patient with low cognitive reserve (low level of studies and no work experience) which has been negatively associated with recovery and evolution in persons with TBI.[23] Complementary evaluations that would incorporate, for example, neuroimaging tests, would be necessary to rule out changes in the brain damage associated to the TBI suffered by the patient.

Taking into consideration the recommendations of the scientific literature on the most appropriate interventions for the young adult population who have suffered a TBI and who have executive function deficits, an approach based on learning metacognitive strategies is proposed in the chronic phase of the disorder. Specifically, an intervention is proposed that includes the recognition and generation of goals, self-control and self-registry of the performance of the tasks, decision making, evaluation of the strategies used in problem solving, obtained from comparison with the target performance, and adjustment of plans, considering one's own or external feedback.[24] This type of intervention, performed within a context that makes it possible to transfer that learned to real life situations is considered the most appropriate care model for the management of the deficits in the executive functions in adults with TBI.[25]

Conclusions

The presence of neuropsychological alterations and in the general functioning of the patient with OPD indicates the importance of considering the neuropsychological evaluation as a key aspect of the rehabilitation process of this type of patients. In our setting, as far as we know, there are no studies on the evolution of OPD associated neuropsychological deficits. Thus, new investigation pathways that approach comprehensive therapeutic strategies for these deficits are necessary, above all in the field of psychiatry. Collaboration circuits and/or efficient referrals between psychiatry services and brain damage rehabilitation that assure a comprehensive care of the needs of OPD subjects need to be established.

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