

Impact of a Holistic Rehabilitation Program in the Post-Stroke Recovery of a Portuguese Woman with a Factor V Leiden

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ABSTRACT

This study evaluates the impact of a holistic neuropsychological rehabilitation program (HNRP) on the recovery of a Portuguese woman (SF) with a Factor V Leiden (FVL), who developed aphasia and right-sided hemiparesis following an ischemic stroke. The HNRP included cognitive training, communication and interpersonal skills, occupational and speech therapy, ICT and employability skills, psychotherapy, and physical rehabilitation. To evaluate the impact of the HNRP, global cognition, verbal comprehension, processing speed, attention, memory, executive function, emotional state, quality of life (QoL) perception, and functionality were assessed before and after the intervention. Results showed that the HNRP had a positive impact on the post-stroke recovery of SF's global cognition, verbal comprehension, attention, cognitive flexibility, as well as muscular functioning, improving a range of activities of daily living.

INTRODUCTION

Ischemic stroke (IS) is a leading cause of disability worldwide, with numbers increasing in young adults. Specifically, the risk of IS is 9-fold higher among young women with FVL who use oral contraceptives and smoke. The activated form of Factor V (FVa) is essential for the synthesis of thrombin during coagulation. The FVL is a guanine to adenine substitution at nucleotide 1691 in the Factor V gene, which slows the inactivation of the FVa, increasing the risk of thrombotic disease. The prevalence of FVL in Europe is 5% but is found in 20% of patients with thrombotic diseases (Kujovich, 2011).

Given the high incidence and significant impact of IS, post-stroke rehabilitation is vital to mitigate its consequences. It is well established that HNRP can reduce cognitive and functional disability after stroke (Cicerone et al., 2019). HNRP aims to promote awareness and acceptance of stroke consequences, and help clients develop compensatory strategies to improve their QoL and return to an active participation in daily activities.

OBJECTIVE: To assess the impact of a holistic neuropsychological rehabilitation program on the post-stroke recovery of a Portuguese women with a Factor V Leiden.

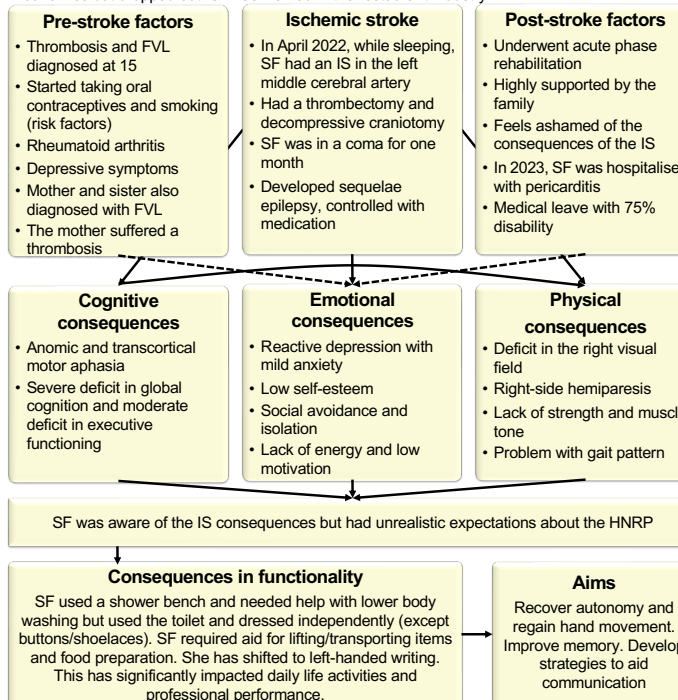
MATERIALS

Table 1 - Protocol used to assess SF pre- and post-intervention

Outcome	Cognitive dimension
MoCA	Global cognition
IFS	Executive functioning
Token Test	Verbal comprehension
d2 Test	Attention
WMS-III	Working memory
Rey Complex Figure	Visual memory and perception
TMT	Attention, visuo-motor capacity, cognitive flexibility
HADS	Emotional state
QOLIBRI	Quality of life perception
ICF	Functionality

PARTICIPANT

SF is a 32-year-old woman. She has completed secondary education and attended the Faculty of Economics but dropped out. SF has worked in the restaurant industry.



METHODOLOGY

- CRPG is a professional rehabilitation centre in the North of Portugal that aims to increase social and economic autonomy of people with disabilities and impairments.
- CRPG was recommended to SF by her physiatrist.
- In July 2023, prior to enrolling in the HNRP, SF was assessed using the protocol described. This protocol was implemented again in February 2024 to assess the intervention's impact.
- SF attended the HNRP from September 4th 2023, to February 20th 2024. During this period, she lived in accommodation provided by CRPG to minimise travelling and to receive support from specialist staff.
- The HNRP lasts 31.5 hours per week, totalling 679 training hours. There is also the possibility of attending an extra 121 hours of work experience or professional training.
- The HNRP comprises cognitive training, communication and interpersonal skills, occupational and speech therapy, ICT and employability skills, psychotherapy, and physical rehabilitation, delivered by a multidisciplinary team.
- The sessions were primarily conducted in a group of 10 clients; however, psychotherapy, physiotherapy, as well as speech and occupational therapy, were conducted individually.

RESULTS AND DISCUSSION

Table 2 - Results of the neuropsychological assessment pre- and post-intervention

Outcome	Pre-intervention		Post-intervention		RCI or z-score	Δ performance
	z-score	Degree of deficit	z-score	Degree of deficit		
MoCa	-5.67	Severe	-2.78	Severe	4.32*	↑
IFS	-2.42	Moderate	-2.81	Severe	-0.49	↔
Token	-22.33	Severe	-9.00	Severe	13.33*	↑
d2-TN	-2.52	Severe	-2.00	Mild	1.67	↔
d2-CR	-1.52	Mild	-1.04	Average	2.40*	↑
d2-TN-E	-2.26	Moderate	-1.70	Mild	1.99*	↑
d2-CP	-1.57	Mild	-1.06	Average	2.55*	↑
d2-FR	-1.53	Mild	-1.17	Average	1.28	↔
d2-E%	-0.92	Average	-0.99	Average	-0.23	↔
WMS-III	-1.53	Mild	-0.87	Average	---	↔
Rey-copy	0.78	Average	1.33	Average	0.55	↔
Rey-memory	0.30	Average	1.04	Average	0.74	↔
TMT-A	7.00	Severe	3.23	Severe	-3.77*	↑
TMT-B	8.70	Severe	4.95	Severe	-3.76*	↑

Average: ≤ 1.50 standard deviation (SD) from the average of the Portuguese population; mild deficit: $1.51-2.00$ SD; moderate deficit: $2.01-2.50$ SD; severe deficit: ≥ 2.51 SD. * Reliable change (RCI $\geq \pm 1.96$ or $z \geq 2$ SD).

- SF had several risk factors for IS (FVL, taking oral contraception, and smoking).
- Following an IS in 2022, which resulted in aphasia and right-sided hemiparesis, SF enrolled in an HNRP.
- The RCI showed improvements in global cognition, verbal comprehension, attention, visuo-motor capacity, and cognitive flexibility post-intervention.
- SF's had moderate depressive symptoms and mild anxiety, which were unchanged throughout the HNRP.
- Regarding QoL after brain injury, all initial scores were below average. Following intervention SF showed greater satisfaction with the cognitive and social dimensions, but changes were not significant.
- Following intervention, SF's hand and arm use went from a complete problem to a moderate one, which improved her ability to eat, as well as lift and carry objects.
- Also, SF's muscle tone/power and gait pattern functions improved, with a positive impact on her ability to walk.

CONCLUSION: The HNRP had a positive impact on the post-stroke recovery of SF's global cognition, verbal comprehension, attention, cognitive flexibility, as well as muscular functioning, improving a range of activities of daily living.

REFERENCES: Cicerone et al. (2019). Evidence-based cognitive rehabilitation: Systematic review of the literature from 2009 through 2014. *Archives of Physical Medicine Rehabilitation*, 100, 1515-1533. Kujovich, J. L. (2011). Factor V Leiden thrombophilia. *Genetics in Medicine: Official Journal of the American College of Medical Genetics*, 13(1), 1-16.