

OBJECTIVE

Soroxchi/Acute Mountain Sickness (AMS) is a condition that occurs at higher altitudes (at least 2,500 MASL) leading to severe illnesses such cerebral and pulmonary hypoxia.^{1, 2}

Neuropsychological research on this condition is minimal; cognitive and behavioral long-term effects are unclear.

Associated cognitive impairments include processing speed, attention, working memory, and executive functions as well as neurobehavioral symptoms: apathy, avolition, irritability, emotional lability, disinhibition, and decrease in spontaneous activity or drive.²⁻⁴

This case study is the first to describe the long-term cognitive and behavioral changes secondary to bilateral globus pallidus (GP) lesions associated with AMS.

CASE DESCRIPTION

Patient: 51-year old, Spanish-speaking male of Mexican descent, nine years of education.

Medical history of hyperlipidemia. Moderate alcohol consumption (12-24 beers on weekends).

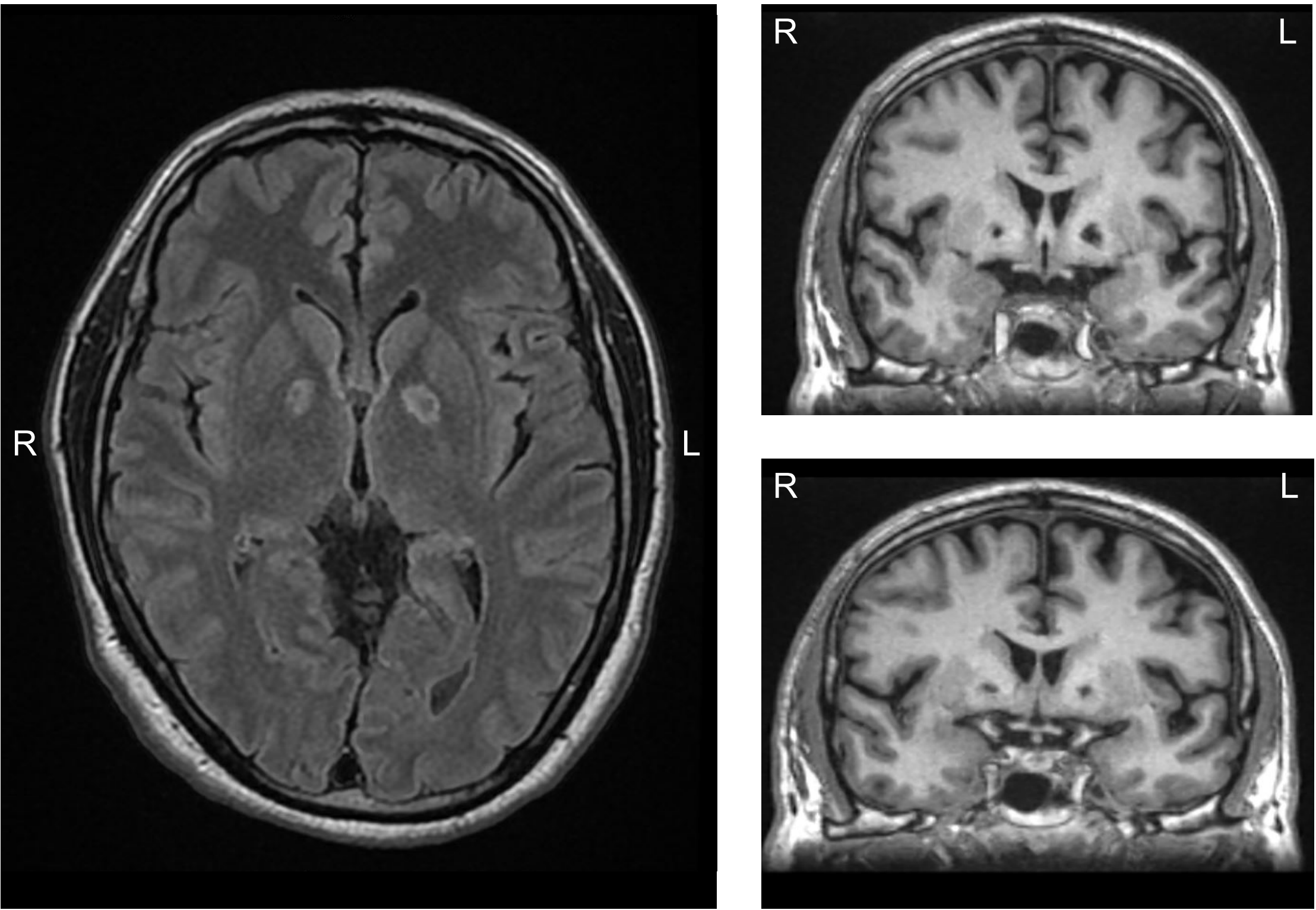
Psychiatric history was unremarkable.

Patient traveled as a roofing contractor (manager position) to La Paz, Bolivia (4,070 MASL).

- Upon arrival, fatigue and dizziness led to a 7-day hospitalization to treat acute pulmonary edema and respiratory failure hypoxia.
- Four months post incident, he was referred to BCM Cerebro.
- Patient reported difficulties with short-term memory, attention, and word-finding. Changes in mood reported by his family.

NEUROIMAGING

Brain MRI 3-months post AMS diagnosis revealed bilateral GP lesions.



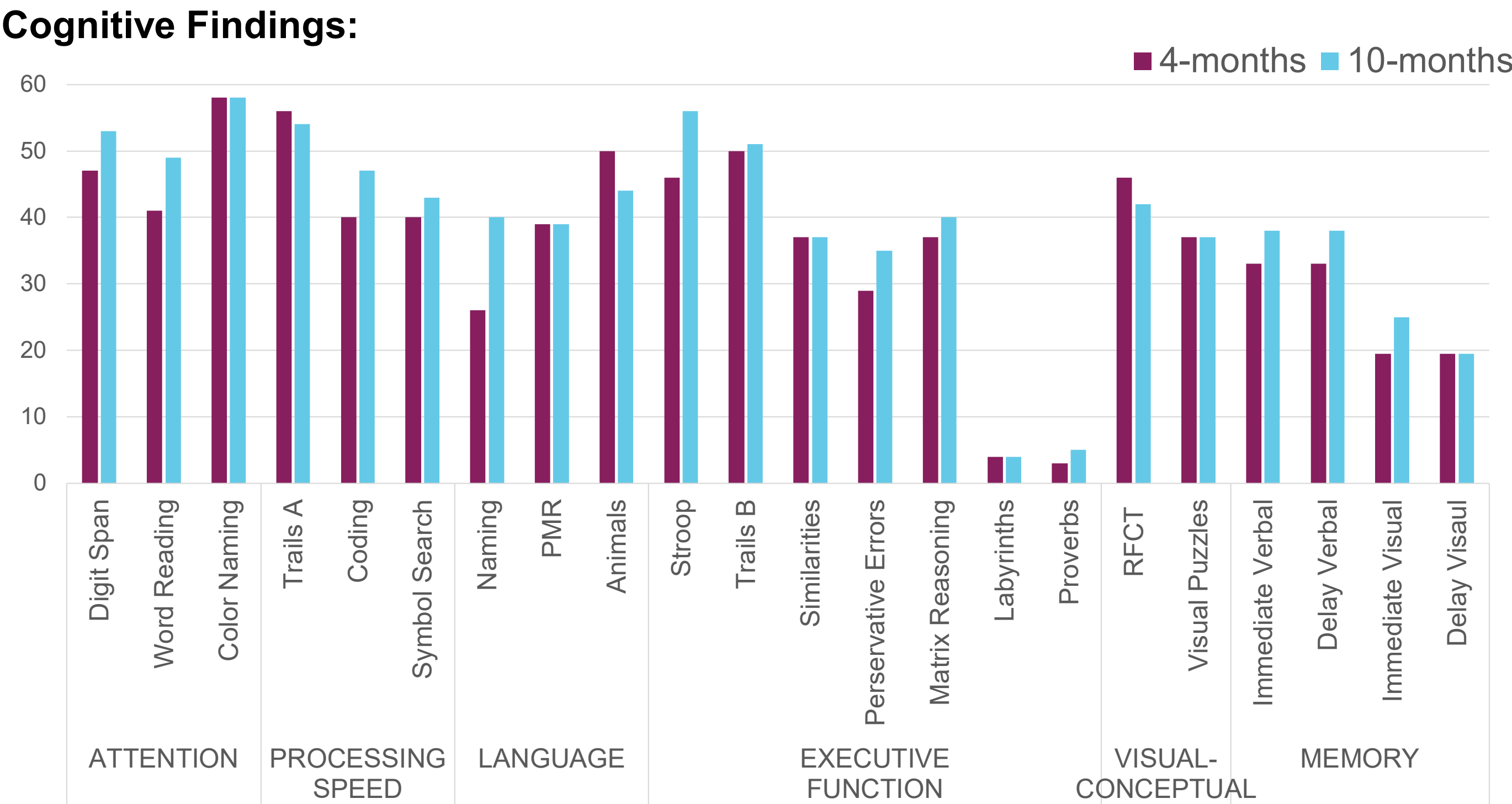
MEASURES ADMINISTERED

Cognitive Scales: Montreal Cognitive Assessment Scale; Word Accentuation Test-Revised; Neuropsychological Screening Battery for Hispanics (WHO-UCLA Auditory Verbal Learning Test and Ponton-Satz Boston Naming Test); Arango Normative Dataset (Figura Geométrica Compleja de Rey; Test de Fluidez Verbal Semántica y Fonológica; Test de Colores y Palabras (Stroop); Test del Trazo (TMT) A & B); La Bateria Neuropsicológica en Español (Test de Fluidez Verbal); Escala Inteligencia para Adultos Wechsler-4ta Edición; Escala de Memoria de Wechsler-IV (WMS-IV), 4ta (Reproducción visual I y II and Memoria lógica I y II); Clock Drawing Test; Wisconsin Card Sorting Test-64 card version; and Bateria Neuropsicológica de Funciones Ejecutivas y Lóbulos Frontales-2nda Edición.

Self-report: Inventario de Depresión de Beck 2da Edición (BDI-II); Cuestionario De Salud del Paciente-9 (PHQ-9); Inventario Multifacético de la Personalidad-2-Minnesota; Escala de Apatía; Escala del Comportamiento del Sistema Frontal (FrSBe).

Collateral: Version Hispana Lawton & Brody Physical Self-Maintenance Scale and Instrumental Activities of Daily Living Scale; Escala de Apatía; Caregiver Neuropsychiatric Inventory Questionnaire (NPI-Q); and Frontal Systems Behavior Scale (FrSBe).

RESULTS



Neurobehavioral Findings:

During the baseline clinical interview, the patient endorsed: depression, anhedonia, and avolition. He denied interim changes during the follow-up appointment.

| | | Symptom | Baseline | Follow-up |
|---------------|------------------|-------------------------|------------------|------------------|
| Self Report | PHQ-9 and BDI-II | Depression | Mild-to-Moderate | Mild-to-Moderate |
| | | Anhedonia | Moderate | Moderate |
| | | Fatigue | Mild | Moderate |
| | | Sleep difficulties | Mild | Mild |
| | | Appetite/eating changes | None | None |
| | Escala de Apatía | Apathy | | Moderate |
| Family Report | FrSBe | Apathy | None | Severe |
| | | Disinhibition | Moderate | Moderate |
| | | Executive dysfunction | None | Moderate |
| | NPI-Q | Depression | Severe | Severe |
| | | Sleep difficulties | Severe | Severe |
| | | Appetite/eating changes | Severe | Severe |
| | Escala de Apatía | Apathy | Severe | Severe |
| | | Apathy | Severe | Severe |
| | FrSBe | Disinhibition | Moderate | Severe |
| | | Executive dysfunction | Severe | Severe |

DIAGNOSTIC IMPRESSIONS & DISCUSSION

Observed executive function deficits are consistent with those found in AMS patients^{3,4} and patients with bilateral GP lesions secondary to other medical complications.

- Visualconceptual declines are a new finding for this type of lesion.⁵

In the absence of functional declines, findings were consistent with a diagnosis of Mild Neurocognitive Disorder due to another medical condition (bilateral GP lesions secondary to hypoxia).

Despite pharmacological and psychotherapy treatments, no interim improvements in neurobehavioral symptoms were noted at the 10-month follow-up.

Patient was scheduled for a third assessment, which was postponed due to a family emergency/significant stressor.

CULTURAL CONSIDERATIONS

This case highlights the need for psychoeducation regarding the impact of brain damage in able-bodied individuals and those who do not have glaring memory problems.

Psychoeducation:

- Frontal lobe-mediated cognitive skills and affective symptoms
- Mental health symptomatology and differences between apathy and depression
- Importance of treatment compliance: medication and counseling; behavioral activation approach

Continued Intervention:

- Changes in personality and behaviors, differences in interpersonal interactions, lack of initiation/involvement in previous hobbies and pastimes
- Appropriate culturally sensitive suggestions of activities and lifestyle changes need to be presented as possible options for the patient to remain engaged

The patient's family has raised questions about the impact of his thinking skills and whether he is safe to work (demoted from managerial duties to blue collar labor). Increase in disinhibition is concerning.

Assessment of neurobehavioral symptoms, behavioral tendencies and functional skills is scheduled to assist with diagnosis and to tailor future recommendations.

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