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CASO CLÍNICO

Bipolar Camouflage: A Cerebellar Cognitive Affective Syndrome Case Report

Camuflagem Bipolar: Um Caso de Síndrome Cognitiva Afetiva do Cerebelo

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ABSTRACT

The cerebellar cognitive affective syndrome is a neuropsychiatric syndrome composed of affective (anxiety, depression, euphoria, and emotional lability) and cognitive symptoms (executive, attentional, and visuospatial deficits) that was described in the 1990s. We present the case of a 49-year-old woman with a history of an acute neurological episode at the age of 28, after which she reported a change in personality, brief and alternating periods of depression, hypomania, and mixed episodes, and cognitive impairment that had a major impact on her personal and occupational level of functioning. She was initially diagnosed with bipolar disorder, but a clinical, neuropsychological, and imaging re-evaluation prompted a diagnostic reconsideration in favor of a cerebellar cognitive affective syndrome. This enabled therapeutical and prognostic refinement. Here, we discuss the diagnostic challenges of this syndrome and the implications that an accurate diagnosis has for patients.
Keywords: Cerebellar Diseases; Cognition Disorders; Mood Disorders

RESUMO

A síndrome cognitiva afetiva do cerebelo é uma síndrome neuropsiquiátrica descrita na década de 1990 caracterizada pela presença de sintomas afetivos (ansiedade, labilidade, depressão ou elação do humor) e cognitivos (défices executivos, atencionais, visuoespaciais) associados a lesões cerebelosas. Apresentamos o caso de uma mulher de 49 anos, com história de um episódio neurológico agudo aos 28 anos, após o qual apresentou um quadro de alteração da personalidade, períodos breves alternantes de depressão, hipomania e episódios com características mistas, bem como alterações cognitivas, com impacto significativo sobre as esferas pessoal e laboral. Foi inicialmente diagnosticada com perturbação afetiva bipolar, mas, após reavaliação clínica, neuropsicológica e avaliação imagiológica, o diagnóstico foi revisto para síndrome cognitiva afetiva do cerebelo. Este facto permitiu um refinamento do plano terapêutico e da perspetiva prognóstica. Neste artigo, discutimos os desafios diagnósticos desta síndrome e as implicações que o correto diagnóstico acarreta para os doentes.
Palavras-chave: Doenças do Cerebelo; Perturbações da Cognição; Perturbações do Humor

INTRODUCTION

Until the 1990s, the cerebellum was associated exclusively with motor coordination and balance. In that decade, Jeremy Schmahmann studied a group of patients with lesions confined to the cerebellum and noticed that they exhibited a set of other deficits, both cognitive and affective in nature, which allowed the identification and description of the cerebellar cognitive affective syndrome (CCAS).[1]

It consists of a neuropsychiatric syndrome resulting from cerebellar lesions of diverse etiologies, including degenerative and vascular origins. From a clinical perspective, CCAS is characterized by: 1) cognitive symptoms, including executive dysfunction, attentional control deficits, visuospatial impairments, and language disturbances[2]; 2) affective symptoms such as blunted affect, emotional lability, anxiety, dysphoria, or depression; 3) impairments in theory of mind; 4) behavioral disturbances such as disinhibition or ritualized behaviors (often associated with ruminative or obsessive thoughts).[3,4] Typically, CCAS presentations correlate with lesions affecting the posterior cerebellar regions.

Even though it is an uncommon condition,[5] CCAS remains underdiagnosed and is frequently misdiagnosed as another neurological or psychiatric condition. This is especially true when its presentation is predominantly affective/behavioral and has significant implications in terms of therapeutic efficacy and iatrogenesis. In this article, the authors present a case of CCAS that was initially diagnosed as bipolar affective disorder (BD), exploring its presentation and evolution over time and reinforcing the therapeutic and prognostic implications that the correct diagnosis determined.

CASE REPORT

We report the case of a 49-year-old woman, divorced, with a 20-year-old son, entitled to a disability pension since she

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was 30 years old. She had a medical history of hypertension, type 2 diabetes, and obstructive sleep apnoea syndrome. There was no family history of psychiatric illness. She was referred to the Psychiatry clinic by the family physician due to loss of psychiatric follow-up and as she had been previously diagnosed with type I BD.

At the age of 28, she was hospitalized for an acute episode of visual, verbal articulation and balance disturbances that lasted less than 12 hours. Before that, she had not had any affective episodes, namely of the depressive type. Since the hospitalization, she describes a personality change with increased impulsivity and disinhibition, and mood swings. She presented brief (lasting a few days) and alternating episodes of depression (sadness, depressive thoughts, psychomotor retardation, social isolation, anhedonia, hypersomnia, neglect of hygiene and household chores), hypomania (increased energy, elevated mood, talkativeness, increased goal-directed activity, decreased need for sleep), and mixed feature episodes (dysphoria, marked emotional lability), accompanied by intense anxiety. Initially, there were no periods of time free of affective symptoms, but these came later on and gradually lasted longer. The patient also reported cognitive changes that manifested simultaneously, characterized by difficulties in planning and attentional control. In particular, she described having difficulties in figuring out how to execute tasks involving multiple steps (e.g., sorting the laundry by colour), no longer being able to pay attention to two stimuli at the same time, and having to make a tremendous effort to be able to focus and perform simple tasks (e.g., calculating the change of a small purchase). This condition radically altered the patient's personal and work functioning, leading to her inability to maintain employment for more than two months and ultimately resulting in disability retirement.

In this context, she was prescribed various psychotropic drugs, having had sequential medication trials and adjustments. In the last years of her previous follow-up, she had been maintained on sodium valproate 500 mg daily, topiramate 300 mg daily, pregabalin 225 mg daily, and trazodone extended release 300 mg at bedtime, and she reported having greater clinical stabilization but still experiencing some affective episodes. Over the years, there has been a gradual fading of affective symptoms as the described affective episodes became subtler, and the patient reported a slight and progressive improvement in cognitive functioning.

She had her first medical appointment in our psychiatry clinic in January 2021, and by then she had already had three years of pharmacological non-compliance due to a loss of follow-up. She had not presented major affective episodes during this period, but maintained rapid and frequent mood swings that had no apparent correlation with life events, as well as pervasive anxiety. That day, she presented with difficulties in sustaining attention, disinhibition, expansive gesturing, a pressured, loud, but organized speech, digressive thinking, a slightly depressed mood, emotional lability, fragmented sleep, and good insight regarding both the psychopathology she presented and the cognitive deficits, which she described with accuracy and detail.

On neurological examination, she was alert, without nystagmus, and without appendicular or gait ataxia.

We performed a neuropsychological assessment (NPA), which confirmed the presence of a cognitive impairment predominantly concerning attentional and executive domains. The NPA documented: a marked impairment in non-verbal abstraction reasoning; moderate deficits in divided attention and ability to alternate between two sets of stimuli; a mild impairment in sustained attention for short and long periods of time, selective attention and inhibitory control, working memory, and phonemic verbal fluency.

We requested a cranial magnetic resonance imaging (MRI), which showed a bilateral lesion of the posterior paravermis, suggestive of a chronic ischemic lesion, and a mild bilateral frontotemporal and cerebellar atrophy.

Given the likely association between the lesion found in the MRI and the clinical episode reported at 28 years of age, the temporal relationship between this clinical episode and the onset of cognitive-affective symptoms, and the patient's neuropsychological profile, we revised the patient's diagnosis to CCAS.

After pharmacological adjustments, and for the last two years, the patient remained stabilized on sodium valproate 750 mg and escitalopram 10 mg daily, without mood swings and without significant anxiety. Despite her disability pension and some persisting difficulties, she has been able to maintain a job as a waitress.

DISCUSSION

Typically, the diagnosis of CCAS is considered in the presence of a cerebellar ataxic syndrome associated with executive and visuospatial cognitive dysfunction and affective symptoms, along with the finding of structural cerebellar lesions. The absence of coordination symptoms can pose difficulties to the diagnostic process,[3] as we observed in the current case, where the predominant neuropsychiatric symptoms mimicked BD. However, the late onset of the psychiatric presentation, its abrupt onset, and the early cognitive dysfunction prompted a differential diagnosis with neurological diseases involving the central nervous system.[6] The progressive attenuation of affective symptoms and cognitive dysfunction over time is also

suggestive of CCAS. In his initial description,[1] Schmahmann described a consistent improvement leading to the remission of cognitive and affective symptoms over several months or a few years. However, numerous cases have been reported where this does not occur.[3,5] Our patient showed gradual improvement, but an unusual duration of affective and cognitive symptoms. We expect that, in the future, she will display further progressive attenuation of her affective and cognitive symptoms.

Bilateral cerebellar lesions, as opposed to unilateral ones, seem to correlate with greater clinical severity, and lesions in the vermis have been linked to cases with predominant affective manifestations.[3] It is important to note that the MRI revealed a pattern of mild atrophy in the frontotemporal region. This pattern did not worsen in subsequent imaging scans and may be explained by diaschisis of cerebellar projections into the frontal and temporal cortices.[3]

Schmahmann's group developed a diagnostic tool consisting of a set of cognitive tests combined with a questionnaire that assesses the patient's emotional expression.[7] This tool is useful for screening patients with suspected or confirmed cerebellar injury; however, it has not yet been validated in the Portuguese population.[8]

From a pharmacological standpoint, there is no specific treatment for this condition, and therefore, the patient was treated symptomatically with a mood stabilizer and an antidepressant. It is worth noting that the dosage of the mood stabilizer used in this case is lower than what is typically required for the treatment of bipolar disorder, and in line with what is expected in a neuropsychiatric syndrome.

Appropriate rehabilitation, not only targeting coordination symptoms, if present, but also cognitive symptoms is recommended and can offer some benefit. Cognitive deficits should be explained in order to enable the patient to deliberately overcome them using compensatory cognitive strategies.[3]

We acknowledge that the absence of detailed clinical and imaging data about the patient's initial hospitalization, at the age of 28, is a substantial limitation of this report.

This case report emphasizes the need to consider CCAS in the differential diagnosis of atypical affective and/or cognitive presentations, even in the absence of coordination and balance disturbances. Neuropsychological assessment and cranial MRI are useful diagnostic tools in investigating CCAS. The presence of CCAS has pharmacological implications, in particular, because its treatment requires lower-than-usual doses of psychotropic drugs, and prognostic implications such as a progressive attenuation of symptoms over time.

PREVIOUS AWARDS AND PRESENTATIONS

A different and simplified version of this clinical case was presented as an oral communication by the author Teresa Reynolds de Sousa (together with three other colleagues) at the XV National Congress of Psychiatry 2021. No prior submission or publication was made in another scientific journal.

AUTHOR CONTRIBUTIONS

TRS, MS: Literature review, writing of the manuscript.
PA, FN: Writing and critical review of the manuscript.
TM: Literature review, writing and critical review of the manuscript.
All authors approved the final version to be published.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

PATIENT CONSENT

Obtained.

COMPETING INTERESTS

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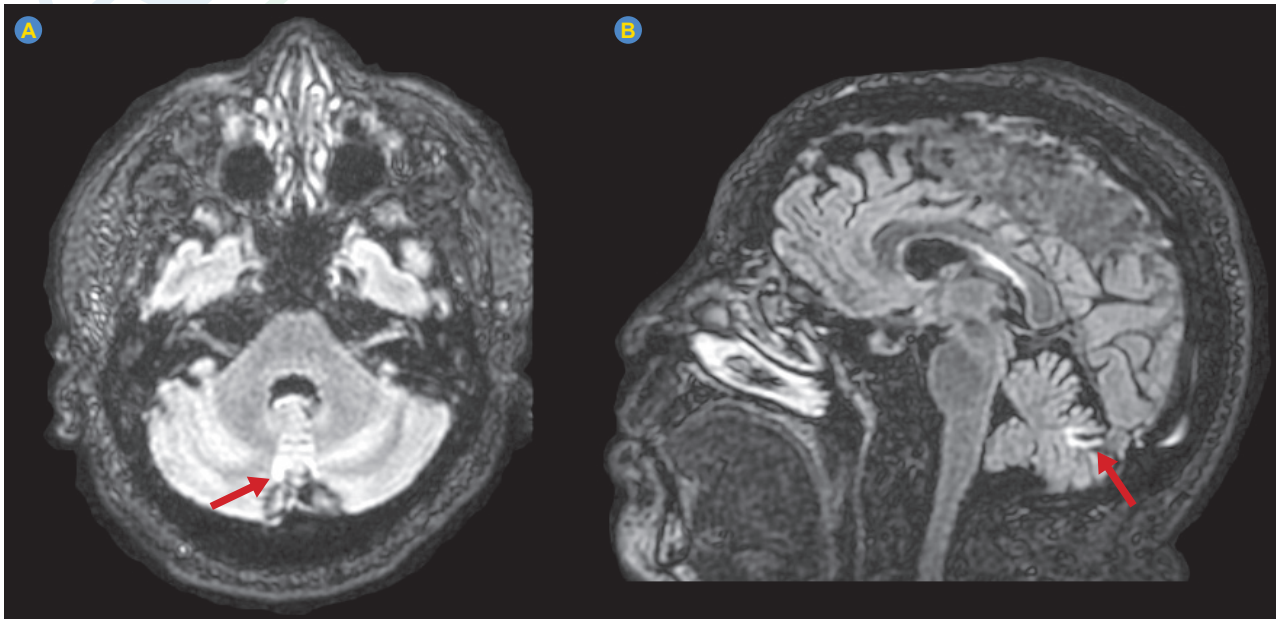

Figure 1 – T2/FLAIR sequence showing an hyperintensity in the paravermian region bilaterally, suggestive of an ischemic lesion

Table 1 – Detailed results of the neuropsychological assessment

	Test	Raw score	z-score
Attention, processing speed and immediate memory	Letter cancellation (“A”)	16/16; 39 s	-1.6
	Trail Making Test part A	59 s	-1.0
	Toulouse-Pieron test – Work efficiency	89	-1.9
	Toulouse-Pieron test – Dispersion index	34%	-1.7
	Stroop test - words	72	-0.68
	Stroop test - colours	36	-1.5
	Digit span forward	5	-0.5
Orientation	Space, time and person	15/15	NA
Executive functions	Digit span backwards	2	-1.8
	Trail Making Test part B	260	-2.4 (score B-A)
	Stroop test interference	7	-1.5 (interference score)
	Phonemic verbal fluency (“P”)	6	-1.3
	Semantic verbal fluency (“animals”)	18	0
	Graphomotor alternation	2/2	NA
	Proverb interpretation	8	0.8
	Raven’s Progressive Matrices	4	-5.1
Memory	Logical memory – immediate recall	8.5	-1.2
	Verbal Paired Associates Test	14	-0.3
	Information (remote memory)	16	-2.1
Visuoperceptual, visuospatial and visuoconstructive abilities	Copy of cube	3	1.2
	Clock drawing	3	0.6
	Incomplete Letters (VOSP subtest)	20/20	NA
	Dot counting (VOSP subtest)	10/10	NA
Calculus	Written calculus	13	-0.9

NA: not applicable.