International Journal of Medical Science and Clinical Research Studies

ISSN(print): 2767-8326, ISSN(online): 2767-8342

Volume 04 Issue 01 January 2024

Page No: 18-21

DOI: https://doi.org/10.47191/ijmscrs/v4-i01-04, Impact Factor: 6.597

Epilepsy as Central Nervous System Involvement in Patient with ANCA-Associated Vasculitis: A Case Report

Martínez Camacho Roberto de Jesús[1], Héctor Murillo Reyna[2], Lilia Itzel Martínez Camacho[3], María Fernanda Ruíz Gómez[4], Santiago Sandoval Correa[5], Hayil Linaldi Sierra[6], Francisco Alejandro González Orozco[7], Eduardo Nieves Paredes[8], Marcos Vela Rivera[9], Consuelo Alejandra Aguirre Gonzalez[10]

[1,2,3,4,5,6,7,8,9,10] Instituto Mexicano del Seguro Social. Hospital General de Zona No. 1 - Dr. Emilio Varela Lujan. Zacatecas, Zacatecas, México.

ABSTRACT

Central nervous system (CNS) involvement by antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV) is a rare presentation. The affected nerve structure determines the symptoms of AAV. Presentation as seizures can make early diagnosis difficult by necessitating the ruling out of other etiologies, which increases mortality in these patients. Serological and imaging studies facilitate the identification of AAV and initiation of timely treatment focused on remission of the autoimmune pathology. We present the case of a young female patient who, after diagnosis with AAV by renal biopsy, presented with several epileptic seizures. With angioresonance, we evidenced vascular involvement and began remission treatment with an adequate resolution of the seizures.

KEYWORDS: Vasculitis, Seizures, Epilepsy, Antineutrophil cytoplasmic antibodies (ANCA)

ARTICLE DETAILS

Published On:
03 January 2024

Available on:
https://ijmscr.org/

INTRODUCTION

AAV is caused by a loss of tolerance to primary granular proteins of neutrophils—leukocyte proteinase 3 (PR3) or myeloperoxidase (MPO), which produces inflammation of the blood vessels, endothelial injury, and tissue damage. AAV affected capillaries, arterioles, and venules, but small arteries and veins can also be affected. There are 3 groups: granulomatosis with polyangiitis, microscopic polyangiitis, and eosinophilic granulomatosis with polyangiitis. [1] The mechanisms vary depending on the specific CNS structures involved. In general, extra-axial lesions affecting the dura mater or pituitary gland mainly relate to granulomatous inflammation, considering vasculitis and disruption of the blood–brain barrier mediate parenchymal pathologies. It is still unclear whether pathogenic ANCAs are produced intrathecally or from systemic circulation and how the 2 ANCA serotypes contribute to different CNS manifestations. The onset of CNS exacerbation is primarily acute or subacute, symptoms present usually late in the course of the disease, no gender predilection is observed, and most patients tend to have their first CNS crisis in middle age. [2] The CNS is affected in <15% of patients with vasculitis but accounts for much of the morbidity in these patients. Heterogeneous CNS symptoms can make early diagnosis difficult, causing delays in treatment and disease progression, leading to relapses or even death. [3]

CLINICAL CASE

A 22-year-old Mexican woman diagnosed with ANCA-associated vasculitis and kidney involvement was admitted to the hospital for first-time seizures. She had a history of chronic kidney disease with hemodialysis sessions 2 times a week, systemic arterial hypertension secondary to pauci-immune glomerulonephritis pANCA diagnosed by renal biopsy 4 months prior, treatment with nifedipine 30 mg/day, telmisartan 40 mg/day, metoprolol 100 mg/day, prednisone 5 mg/day, and a dose of rituximab every 8 days. After waking up, presented 2 tonic-clonic seizures lasting 10 minutes without a postictal period. The neurological examination did not show motor or sensory deficits or alteration in any other organs.

A diagnostic protocol was started, and the laboratory-controlled blood count, metabolic, electrolyte, and autoimmune profile had no alterations and found kidney control goals. Only the acute phase reactants and ANCAs were slightly elevated. Because of immunosuppressive treatment, which carries a risk of infection, a cerebrospinal fluid study was evaluated. It was normal, and the culture

showed no later development. Computed axial tomography of the brain did not reveal any anatomical alterations. She had another seizure 24 hours after admission, so treatment with benzodiazepine and carbamazepine 400 mg/day was started. We requested an evaluation by rheumatology and neurology, who determined probable neurologic involvement due to vasculitis associated with ANCAs. A contrast-enhanced brain MRI was performed, which showed areas of stenosis in the left opercular branches and posterior cerebral artery as well as in the lenticulostriate arteries, with no evidence of ischemia or hemorrhage (Figure 1 and 2).

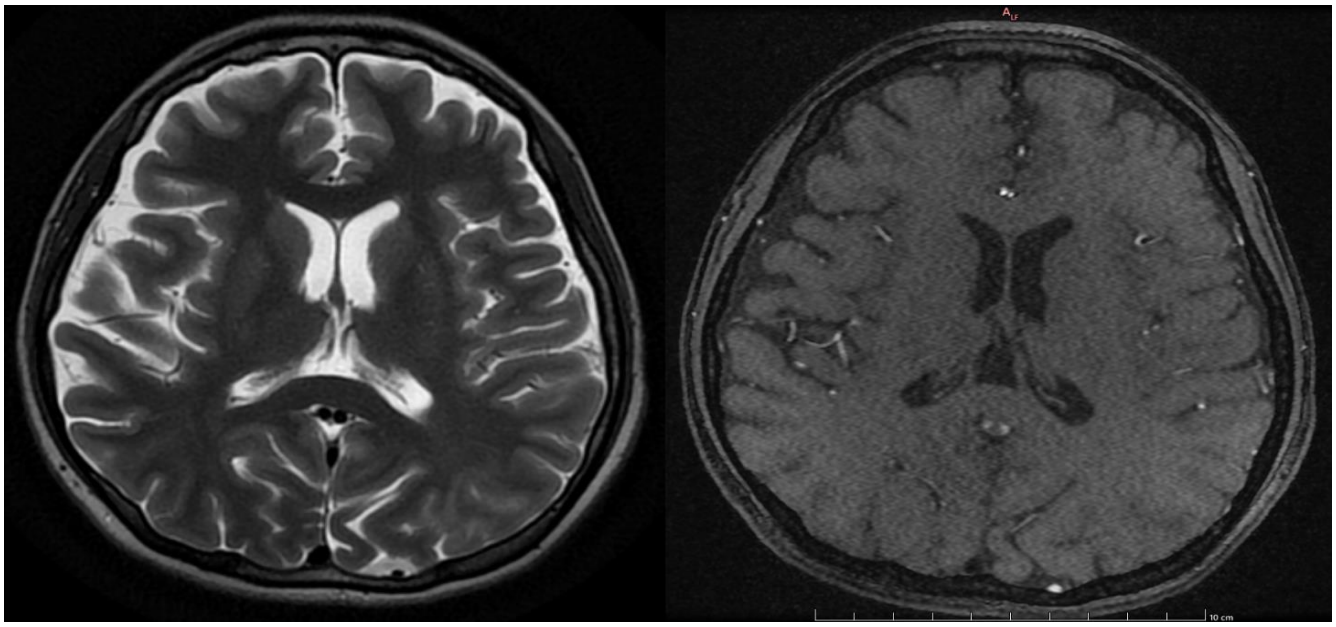

Figure 1. T2 brain MRI without evidence of injury to the parenchyma or meninges.

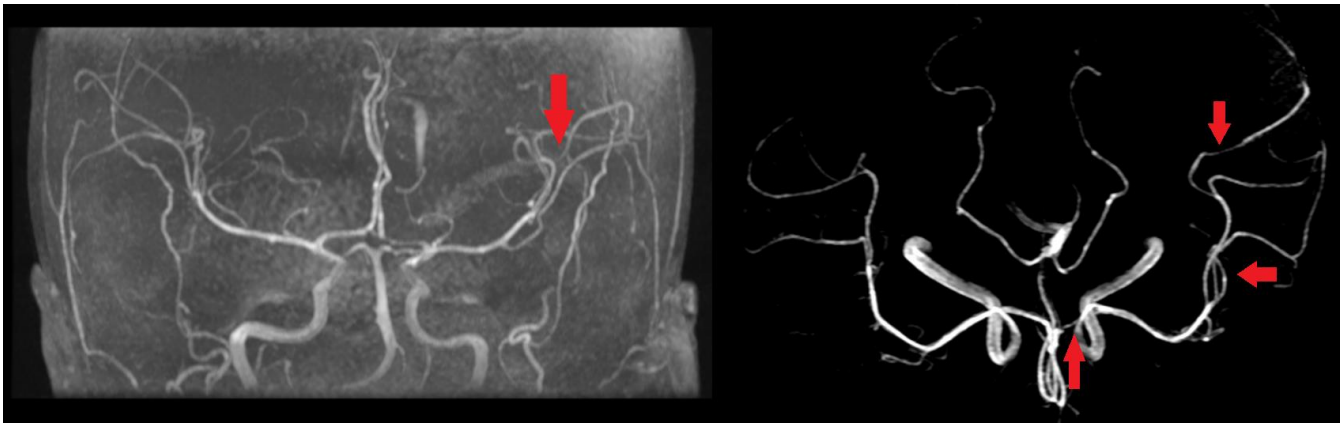

Figure 2. Magnetic resonance angiography showing areas of stenosis.

Upon determining the involvement of vasculitis, we began remission treatment with intravenous methylprednisolone 1 g for 3 consecutive days, followed by 1 mg/kg orally daily. During his evolution, no new seizures occurred, neurological status was adequate, and control studies and hemodialysis sessions were carried out without alterations. During follow-up, in addition to the same anticonvulsant therapy, maintenance therapy was adjusted to prednisone 5 mg per day and mycophenolate mofetil 1g per day, emphasizing the importance of avoiding triggers and proper adherence to the treatment of the autoimmune pathology.

DISCUSION

CNS symptoms in patients with vasculitis vary and are caused by the corresponding structures, including the dura mater, brain parenchyma, pituitary gland, spinal cord, and leptomeninges. In the involvement of the brain parenchyma, ischemic cerebrovascular events and intracranial hemorrhages are observed; they can be the initial presentation and are always associated with significant morbidity. Other symptoms may include headache and encephalopathy (seizures, neuropsychiatric disorders, confusion, or altered consciousness). [4]

In 2014, the International League Against Epilepsy proposed a practical clinical definition of epilepsy, including any of the following: (1) at least 2 unprovoked (or reflex) seizures occurring more than 24 hours apart; (2) one unprovoked seizure (or reflex) and a probability of having more seizures similar to the overall risk of recurrence (at least 60%) after 2 unprovoked seizures, occurring within the next 10 years; or

(3) diagnosis of an epilepsy syndrome. Clinical features alone can be used to diagnose convulsive epilepticus. One of the cornerstones of initial treatment is investigation and treatment of epilepticus' underlying trigger. When deciding on a prophylactic anticonvulsant, the risk of recurrence, severity and potential impact of new seizures, and medication's possible adverse effects should be considered. [5-6]

In the case of our patient, who met the definition of epilepsy—CNS involvement secondary to vasculitis—we requested a complete analysis to rule out the condition's most common causes, including blood count, metabolic profile, autoimmune panel, endocrine panel, and complement level. Laboratory tests often show elevated markers of inflammation. Tests of kidney function on hemodialysis were evaluated. Autoantibodies other than ANCA may be present, including antinuclear antibodies, rheumatoid factors, IgG4, antiglomerular basement membrane antibodies, and antiphospholipid antibodies. Differential diagnosis requires investigation of possible infections (tuberculosis, human immunodeficiency virus, hepatitis). The differences between ANCA serotypes, MPO-ANCA and PR3-ANCA, play a crucial role in evolution. The 2 serotypes affect the nervous system with a similar frequency, but they differ in pattern and severity. Positive MPO-ANCA, lesions limited to the dura mater and upper respiratory tract, predominates in older adult women. Patients with positive PR3-ANCA have more severe neurological damage and widespread progression. [7]

The diagnosis of CNS involvement in vasculitis requires clinical; serological; radiographic; and, when available, pathological evidence. The combination of positive ANCA and certain clinical characteristics is sufficient for diagnosis. ANCA levels alone are useful but not sufficient to determine disease relapse or reflect disease activity, and they are not recommended to guide clinical decisions about treatment. Our patient did not have lesions in the parenchyma. In this case, contrast-enhanced magnetic resonance angiography of the brain provides better images and greater sensitivity. Histopathology is the gold standard for diagnosis; samples can be taken from affected organs, most commonly the kidneys and skin. However, a negative biopsy result does not exclude the diagnosis of vasculitis due to the segmental nature of the lesions. [8-9]

AAV Treatment is made up of 2 phases: remission-induction and remission-maintenance, essential to prevent relapses and achieve long-term remission of CNS symptoms. Remission-induction consists of high doses of glucocorticoids and oral or intravenous cyclophosphamide. This treatment is effective in 70%–90% of patients, and the oral regimen may better prevent relapses. Considering the patient's age and effective response to glucocorticoid therapy, we decided not to use cyclophosphamide because of its cumulative toxicity, which can cause infertility, bladder hemorrhage, severe cytopenia, serious infection, and an increased risk of malignancy. Once complete remission is achieved (absence of disease activity after 8 to 12 weeks), maintenance therapy for at least 24 months should begin to prevent further relapses, consisting of low-dose glucocorticoids and an oral immunosuppressive agent such as azathioprine, methotrexate, mycophenolate mofetil, or rituximab. Rituximab is a potentially safer and more effective maintenance drug than the other options; however, its utility and toxicity profile requires further confirmation. [3, 9-10]

CONCLUSION

In the initial diagnostic approach to epilepsy, even though it is rare, it is important to take into account the history of an autoimmune disease. Vasculitis associated with ANCAS has a systemic involvement, in the central nervous system the symptoms are very variable because it depends on the affected structures. Currently ANCAS levels do not determine the management or severity of the disease. In the case of our patient, determining by angioresonance the vascular inflammation that generated areas of stenosis favored the timely initiation of treatment and remission of the disease, all of this reducing complications and mortality.

REFERENCES

I. Paroli M, Gioia C, Accapezzato D. New Insights into Pathogenesis and Treatment of ANCA-Associated Vasculitis: Autoantibodies and Beyond. Antibodies (Basel). 2023 Mar 21

II. Fragoulis GE, Lionaki S, Venetsanopoulou A, Vlachoyiannopoulos PG, Moutsopoulos HM, Tzioufas AG. Central nervous system involvement in patients with granulomatosis with polyangiitis: a single-center retrospective study. Clin Rheumatol. 2018 Mar;37(3):737-747. doi: 10.1007/s10067-017-3835-y. Epub 2017 Sep 15.

III. Zheng Y, Zhang Y, Cai M, Lai N, Chen Z, Ding M. Central Nervous System Involvement in ANCA-Associated Vasculitis: What Neurologists Need to Know. Front Neurol. 2019 Jan 10;9:1166. doi: 10.3389/fneur.2018.01166.

IV. Graf J. Central Nervous System Disease in Antineutrophil Cytoplasmic Antibodies-Associated Vasculitis. Rheum Dis Clin North Am. 2017 Nov;43(4):573-578. doi: 10.1016/j.rdc.2017.06.006.

V. Wirrell E. Evaluation of First Seizure and Newly Diagnosed Epilepsy. Continuum (Minneap Minn). 2022 Apr 1;28(2):230-260. doi: 10.1212/CON.0000000000001074.

VI. Migdady I, Rosenthal ES, Cock HR. Management of status epilepticus: a narrative review. Anaesthesia. 2022 Jan;77 Suppl 1:78-91. doi: 10.1111/anae.15606.

VII. Yokoseki A, Saji E, Arakawa M, Kosaka T, Hokari M, Toyoshima Y, et al. Hypertrophic pachymeningitis: significance of myeloperoxidase anti-neutrophil cytoplasmic antibody. Brain (2014) 137(Pt 2):520–36. doi: 10.1093/brain/awt314

VIII. Ferlazzo E, Gambardella A, Bellavia M, Gasparini S, Mumoli L, Labate A, Cianci V, Russo C, Aguglia U. Positivity to p-ANCA in patients with status epilepticus. BMC Neurol. 2014 Jul 17;14:148. doi: 10.1186/1471-2377-14-148.

IX. Sherri A, Mortada MM, Makowska J, Lewandowska-Polak A. Primary angiitis of the CNS and ANCA-associated vasculitis: from pathology to treatment. Rheumatol Int. 2023 Sep 30. doi: 10.1007/s00296-023-05461-9.

X. Sánchez-Román E, Monternach-Aguilar F, Reyes-Vaca JG, Rodríguez Leyva I (2021) Challenging presentation of primary vasculitis of the central nervous system. Cereb Circ Cogn Behav. https://doi.org/10.1016/j.cccb.2021.100027