Transient Amaurosis and Persistent Migraine Aura Without Infarction in a Pregnant Woman: A Challenging Presentation

Jorge Andrés Hurtado Mayor [a], Nathalia Fernández Gómez [b], Rosa Helena Morales Benítez [c], Juliana Vélez Tamayo [d], Andrés Felipe Erazo Narváez [e]

a. Physician and Epidemiologist. University of Caldas. ESE San Antonio Departmental Hospital, Roldanillo, Colombia. ORCID: https://orcid.org/0000-0003-2433-3937.

b. Physician. Pediatrics Resident. Corporación Universitaria Remington, Medellín, Colombia. ORCID: https://orcid.org/0009-0006-7640-5815.

c. Physician. Obstetrics and Gynecology Resident. Corporación Universitaria Remington, Medellín, Colombia. ORCID: https://orcid.org/0009-0006-9698-4068.

d. Medical Student. Universidad de Caldas, Manizales, Colombia. ORCID: https://orcid.org/0009-0002-6046-4619.

e. Physician. Specialist in Epidemiology, Gynecology, and Obstetrics. Universidad de Caldas, Manizales, Colombia. ORCID: https://orcid.org/0000-0003-0545-4848.

DOI: 10.22517/25395203.25732

Abstract:

Introduction: Amaurosis, the partial or total loss of vision, can be associated with migraine, a condition common in women of reproductive age. During pregnancy, hormonal changes may exacerbate migraine. This report describes a case of migraine with persistent aura without infarction associated with transient amaurosis in a pregnant woman, detailing her diagnosis, treatment, and follow-up.

Case Presentation: A 29-year-old multigravida patient with a history of migraine with aura, at 20 weeks and 4 days of pregnancy, presented with intense headache and acute loss of vision. Evaluations showed variable blood pressure readings and nonspecific findings on magnetic resonance imaging and tomography, with no evidence of infarction. She was evaluated by several specialists, and preeclampsia/eclampsia was ruled out. She was diagnosed with migraine with persistent aura without infarction and was treated with amitriptyline and cyclobenzaprine, in addition to physical therapy.

Discussion: The differential diagnosis in pregnant women with sudden loss of vision includes preeclampsia, eclampsia, and other neurovascular conditions. Migraine with persistent aura without infarction, although rare,

can present neurological symptoms that mimic severe pathologies, highlighting the importance of a broad diagnostic approach. Conclusion: It is important to consider migraine with persistent aura without infarction in the differential diagnosis to avoid delays in treatment and complications.

Keywords: Amaurosis fugax; migraine with prolonged aura; case report; central nervous system diseases; neuroimaging.

Introduction

Amaurosis refers to the complete loss of visual acuity, which can manifest unilaterally or bilaterally and may or may not be associated with organic causes (1, 2), such as vascular disorders, structural abnormalities of the eyeball, or neurological conditions—the latter being common in women of childbearing age (3, 4). It is estimated to affect approximately 12% of the population, and in 25–30% of cases, it is accompanied by symptoms known as aura, of which about 98% are visual (5). Although migraine auras usually resolve spontaneously within minutes, they can sometimes persist for more than 60 minutes or even up to a week. In such cases, they are classified as "persistent aura" (6, 7). Persistent migraine aura without infarction (PMAWI) is defined by the continuation of aura symptoms for more than a week without radiological evidence of cerebral infarction (8).

During pregnancy, the prevalence of migraine is estimated to be around 20%, with an increased risk of migraine with aura due to hormonal changes (9, 10).

The clinical case presented describes a patient in the second trimester of pregnancy with a history of migraine, who had previously experienced mild and transient visual disturbances that resolved spontaneously within minutes. However, during the current pregnancy, she presented with a severe headache associated with sudden loss of visual acuity and a syncopal episode. During medical evaluation, only an elevated blood pressure reading was recorded, with no other significant findings apart from decreased visual acuity on physical examination. Endothelial damage and hypertensive disorders of pregnancy, such as preeclampsia/eclampsia—considered the main differential diagnosis—were ruled out (11).

The aim of this manuscript is to describe a case of persistent migraine aura without infarction associated with total amaurosis during pregnancy, and to detail its clinical course, diagnostic approach, treatment, and follow-up. Lack of clinical recognition, delayed diagnosis, and unnecessary use of resources may hinder timely treatment (12). The importance of this case

lies in the wide range of differential diagnoses and the need for timely clinical and radiological diagnosis, contributing to the published regional and national case literature and offering insights into the management of persistent migraine aura without infarction during pregnancy.

Case Description:

-year-A 29-year-old female, G4P3V3, with a history of migraine with aura prior to pregnancy since adolescence, presented with a history of three episodes of transient visual acuity loss lasting only seconds, which self-resolved without sequelae, with full recovery of vision. She was 20 weeks and 4 days pregnant at the time of presentation. The patient came to the emergency department with a 30-minute history of acute onset consisting of intense holocranial headache associated with rotational dizziness, which did not improve with self-administered oral analgesics. Following this, she experienced a syncopal episode, with an immediate recovery of postural tone and consciousness, no loss of sphincter control, and no signs suggestive of post-ictal state, but with complete loss of visual acuity.

On physical examination, the patient was notably anxious, with blood pressure of 140/88 mmHg, a blood glucose level of 104 mg/dL, and a fetal heart rate of 145 bpm. She was transferred to the obstetrics service, where her vital signs were stable, and her blood pressure was 109/67 mmHg. A complete neurological examination showed no focal neurological signs, but bilateral isocoric pupils were noted, with a decreased photomotor and consensual reflex. There was a complete abolition of visual acuity.

The patient was evaluated by the gynecology team, who began comprehensive management, initially considering hypertensive disorder of pregnancy with preeclampsia with severe features due to neurological involvement. An endothelial damage profile was requested, and the results were completely normal. Subsequent blood pressure readings taken every 30 minutes were 126/71 mmHg, 110/57 mmHg, 126/66 mmHg, 120/73 mmHg, 119/65 mmHg, and 114/64 mmHg. Due to diagnostic uncertainty, the patient was transferred to a level III unit, where she was evaluated by the neurology service. Neurology noted partial improvement in visual acuity, with color and contour discrimination at a distance of 30 centimeters, without detecting other neurological alterations.

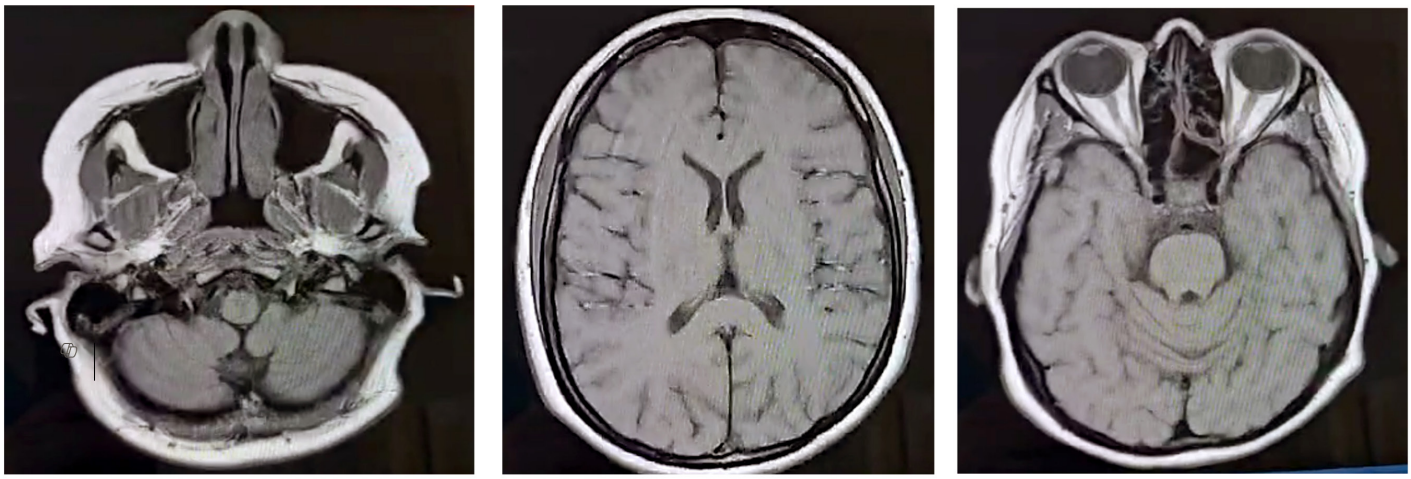
As part of the diagnostic imaging method, an MRI was performed, which showed a lesion in the white matter consistent with a right frontal focus of nonspecific gliosis and the presence of an image compatible with a lobar

microhemorrhage in the right middle frontal gyrus, possibly related to a cavernous malformation. However, these findings were not consistent with the clinical presentation, so a simple cranial CT scan was requested, which returned completely normal results. A repeat endothelial damage profile was performed, revealing 24-hour proteinuria of 345 mg/dL without other abnormalities. By unanimous decision, the neurosurgery, neurology, and gynecology services decided to transfer the patient to a level IV institution for additional tests.

Upon arrival at the level IV institution, the patient underwent an exhaustive evaluation by ophthalmology, neurology, gynecology, perinatology (no evidence of fetal pathology), physiatry (which detected spasm in the occipital muscles), and psychiatry. A cerebral angiogram was conducted, which ruled out malformations, expansile lesions, and/or vascular abnormalities, as well as any changes in the ventricular system, orbits, paranasal sinuses, and mastoids (Figure 1). The endothelial damage profile and normal blood pressure readings led to the final diagnosis of migraine with persistent aura and ophthalmological involvement, along with refractory tension-type headache, not associated with hypertensive pregnancy disorders, and with no fetal impact.

Currently, the patient has diminished visual acuity, with paroxysmal episodes of intense headache that worsen the quality of her vision. She is awaiting the completion of physical therapy sessions and muscle trigger point injections, along with occipital nerve blockade as indicated by the physiatrist. She is on pharmacological treatment with amitriptyline 25 mg every 24 hours and cyclobenzaprine 10 mg every 24 hours. Strict follow-up has been arranged with gynecology, perinatology, and clinical neurology in level IV institutions until the end of the pregnancy.

Figure 1. Angio-Magnetic Resonance Imaging of the brain in axial section: Visualization of the posterior fossa, ventricular system, and orbital structures at three levels.



* Own elaboration.

Note: The visualized arterial structures appear normal; no dissections, occlusions, stenosis, or aneurysms are observed. The ventricular system shows no abnormalities, and there is no evidence of intracranial hemorrhage or extra-axial collections. The visualized portion of the orbits, paranasal sinuses, and mastoids shows no alterations.

Discussion:

Headaches are a common cause of consultation during pregnancy and can be associated with various conditions, such as preeclampsia and migraines (13, 14). In this case, the patient presented with intense headache, acute loss of visual acuity, and a syncopal episode, which initially led to considering diagnoses such as preeclampsia/eclampsia, neurovascular conditions, and ophthalmologic disorders (15). However, the nonspecific findings in the magnetic resonance imaging (MRI) and computed tomography (CT) scans, along with the absence of significant proteinuria and variable blood pressure readings, guided the diagnosis towards persistent aura without infarction (PAWI). The prevalence of PAWI in pregnant women is not clearly established due to the low number of reported cases and the lack of specific studies in this population (17). This condition can present with prolonged neurological symptoms that mimic other severe pathologies, highlighting the importance of first ruling out more common and dangerous conditions (16).

A review of the literature revealed two relevant reports: the first, from 1995, describes three groups of patients suspected of having PAWI (18); the second is a case of a 28-year-old woman with recurrent episodes of

scotomas and loss of visual acuity during migraine attacks, without evidence of infarction (19). Neither of these reports included pregnant women (20).

The diagnosis of migraine with aura is clinical and is characterized by pulsating, unilateral pain, accompanied by nausea and photophobia, with or without auras, which are transient neurological symptoms, visual or sensory in nature (21). The absence of radiological evidence of cerebral infarction is key.

In this case, although the symptoms suggested a possible neurovascular condition, preeclampsia was ruled out through endothelial damage tests and continuous blood pressure monitoring, in line with the recommendations for managing complex cases during pregnancy. Visual acuity loss associated with migraines occurs in approximately 19% of cases (22) and is explained by endothelial and platelet dysfunction, similar to the pathophysiology of preeclampsia (22). This phenomenon is related to vasogenic edema, disruption of the blood-brain barrier, neuroinflammation, and loss of cerebral vascular autoregulation (23).

The treatment included amitriptyline and cyclobenzaprine, supplemented with physical therapy and trigger point muscle blocks. This multidisciplinary approach, supported by the literature, suggests the use of tricyclic antidepressants like amitriptyline to prevent new migraine episodes (9). The combination of physical therapy and occipital nerve block to manage trigger points and treat pain is an effective practice. While the use of triptans and antiemetics is recommended for acute migraine management, these were not employed in this case due to safety considerations during pregnancy (5, 14).

The patient's follow-up included regular checks by obstetrics, neurology, and physiatrics at a level IV institution, in line with recommendations for managing complex neurological conditions during pregnancy (24). The patient continues to be under observation to monitor the evolution of her visual acuity and headache episodes, focusing on preventing recurrences and improving her quality of life.

PAWI should be considered in the differential diagnosis of pregnant women with acute visual acuity loss to avoid treatment delays and potential complications (25). In this case, the patient received a proper diagnosis and treatment after a thorough evaluation, allowing the exclusion of other severe conditions such as preeclampsia and neurovascular disorders (25). Table 1 describes the differential characteristics of PAWI and preeclampsia/eclampsia.

Table 1. Differential Characteristics of Persistent Aura Without Infarction and Preeclampsia/Eclampsia.

Characteristic	Migraine with persistent aura without infarction	Preeclampsia/Eclampsia
Definition	Recurrent headache with persistent visual symptoms without brain damage.	Hypertensive disorder of pregnancy with varying degrees of severity and involvement.
Onset	Usually before pregnancy	After 20 weeks of gestation..
Classic Symptoms/Signs	Visual aura (scotomas, flashing lights), intense headache, nausea, vomiting, and in rare cases, amaurosis.	Hypertension, headache, tinnitus, phosphenes, epigastric pain.
Headache Characteristics	Intense throbbing, mainly unilateral, gradually worsening, associated with nausea, vomiting, photophobia, and phonophobia. Improves with common analgesics.	Intense, holocranial, ponderous, may be associated with perception of phosphenes, and does not improve with common analgesics.
Blood Pressure	Normal or slightly elevated during pain episodes.	≥140/90 mmHg.
Paraclinical Tests	Brain MRI to exclude infarction, EEG if epileptiform activity is suspected.	Proteinuria (>300 mg/24 hours), blood count, liver and kidney tests.
Risk Factors	Personal or family history of migraines, stress, certain foods.	First-time parenthood, obesity, history of preeclampsia, chronic hypertension.
Treatment	NSAIDs, pyrazolones, triptans, antiemetics.	Antihypertensives + magnesium sulfate and termination of pregnancy according to classification
Complications	Potential progression to chronic migraine, anxiety, depression.	Kidney failure, placental abruption, maternal and fetal death.

* Adapted from (16 and 17).

Notes: MRI: Magnetic Resonance Imaging, EEG: Electroencephalogram, NSAIDs: Non-Steroidal Anti-Inflammatory Drugs.

The management of persistent aura without infarction (PAWI) during pregnancy requires a multidisciplinary approach, including both pharmacological and non-pharmacological therapy, along with close follow-up to monitor symptom progression and prevent maternal and fetal complications. Early detection and treatment are crucial for maternal and fetal well-being. Although less common, persistent migraine aura without infarction should be considered to ensure optimal management. Proper clinical suspicion and timely intervention can significantly improve clinical outcomes and reduce the need for unnecessary interventions.

References

1. Charles A, Hansen JM. Migraine aura: new ideas about cause, classification, and clinical significance. Curr Opin Neurol [Internet]. 2015 Jun [cited 2024 Oct 10];28(3):255–60. Available from: https://doi.org/10.1097/wco.0000000000000193
2. Olga Acuña C. Pérdida transitoria de la visión. Revista Médica Clínica Las Condes [Internet]. 2010 Nov [cited 2024 Oct 10];21(6):966–70. Available from: https://doi.org/10.1016/S0716-8640(10)70623-4
3. Luda E, Bo E, Sicuro L, Comitangelo R, Campana M. Sustained Visual Aura: A Totally New Variation of Migraine. Headache: The Journal of Head and Face Pain [Internet]. 1991 Oct 20 [cited 2024 Oct 10];31(9):582–3. Available from: https://doi.org/10.1111/j.1526-4610.1991.hed3109582.x
4. Lagman-Bartolome AM, Lay C. Migraine in Women. Neurol Clin [Internet]. 2019 Nov [cited 2024 Oct 10];37(4):835–45. Available from: https://doi.org/10.1016/j.ncl.2019.07.002
5. Fraser CL, Hepschke JL, Jenkins B, Prasad S. Migraine Aura: Pathophysiology, Mimics, and Treatment Options. Semin Neurol [Internet]. 2019 Dec 17 [cited 2024 Oct 10];39(06):739–48. Available from: https://doi.org/10.1055/s-0039-1700525
6. Cutrer FM, Huerter K. Migraine Aura. Neurologist [Internet]. 2007 May [cited 2024 Oct 10];13(3):118–25. Available from: https://doi.org/10.1097/01.nrl.0000252943.82792.38
7. Arca KN, VanderPluym JH, Halker Singh RB. Narrative review of neuroimaging in migraine with aura. Headache: The Journal of Head and Face Pain [Internet]. 2021 Oct 26 [cited 2024 Oct 10];61(9):1324–33. Available from: https://doi.org/10.1111/head.14191
8. Cao Y, Welch KMA, Aurora S, Vikingstad EM. Functional MRI-BOLD of Visually Triggered Headache in Patients With Migraine. Arch Neurol [Internet]. 1999 May 1 [cited 2024 Oct 10];56(5):548. Available from: https://doi.org/10.1001/archneur.56.5.548
9. Tanos V, Raad EA, Berry KE, Toney ZA. Review of migraine incidence and management in obstetrics and gynaecology. European Journal of Obstetrics & Gynecology and Reproductive Biology [Internet]. 2019 Sep [cited 2024 Oct 10];240:248–55. Available from: https://doi.org/10.1016/j.ejogrb.2019.07.021
10. Darabaneanu S, Kropp P, Niederberger U, Strenge H, Gerber WD. Effects of Pregnancy on Slow Cortical Potentials in Migraine Patients and Healthy Controls. Cephalalgia [Internet]. 2008 Oct 1 [cited 2024 Oct 10];28(10):1053–60. Available from: https://doi.org/10.1111/j.1468-2982.2008.01653.x

11. Swartz RH, Cayley ML, Foley N, Ladhani NNN, Leffert L, Bushnell C, et al. The incidence of pregnancy-related stroke: A systematic review and meta-analysis. International Journal of Stroke [Internet]. 2017 Oct 8 [cited 2024 Oct 10];12(7):687–97. Available from: https://doi.org/10.1177/1747493017723271

12. Kissoon NR, Cutrer FM. Aura and Other Neurologic Dysfunction in or with Migraine. Headache: The Journal of Head and Face Pain [Internet]. 2017 Jul 19 [cited 2024 Oct 10];57(7):1179–94. Available from: https://doi.org/10.1111/head.13101

13. Lacunza Paredes RO, Pacheco-Romero J. Implicancias neurológicas de la preclampsia, más que solo eclampsia. Revista Peruana de Ginecología y Obstetricia [Internet]. 2015 [cited 2024 Oct 10];407–16. Available from: http://www.scielo.org.pe/scielo.php?script=sci_arttext&pid=S2304-51322015000400010

14. Chaves Loaiza E, Silva Díaz RF, Solis Solis JB. Actualización en cefaleas durante el embarazo. Revista Medica Sinergia [Internet]. 2020 Jan 1 [cited 2024 Oct 10];5(1):e337. Available from: https://doi.org/10.31434/rms.v5i1.337

15. Kaniecki RG, Levin AD. Headache in the elderly. In: Handbook of Clinical Neurology [Internet]. 2019 [cited 2024 Oct 10]. p. 511–28. Available from: https://doi.org/10.1016/b978-0-12-804766-8.00028-5

16. Hernandez J, Molina E, Rodriguez A, Woodford S, Nguyen A, Parker G, et al. Headache Disorders: Differentiating Primary and Secondary Etiologies. J Integr Neurosci [Internet]. 2024 Feb 20 [cited 2024 Oct 10];23(2):43. Available from: https://doi.org/10.31083/j.jin2302043

17. Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. Cephalalgia [Internet]. 2018 Jan 25 [cited 2024 Oct 10];38(1):1–211. Available from: https://doi.org/10.1177/0333102417738202

18. Liu GT, Schatz NJ, Galetta SL, Volpe NJ, Skobieranda F, Kosmorsky GS. Persistent positive visual phenomena in migraine. Neurology [Internet]. 1995 Apr [cited 2024 Oct 10];45(4):664–8. Available from: https://doi.org/10.1212/wnl.45.4.664

19. San-Juan O, Zermeño P. Migraine with Persistent Aura in a Mexican Patient: Case Report and Review of the Literature. Cephalalgia [Internet]. 2007 May 1 [cited 2024 Oct 10];27(5):456–60. Available from: https://doi.org/10.1111/j.1468-2982.2007.01307.x

20. Russell MB, Rasmussen BK, Thorvaldsen P, Olesen J. Prevalence and Sex-Ratio of the Subtypes of Migraine. Int J Epidemiol [Internet]. 1995 [cited 2024 Oct 10];24(3):612–8. Available from: https://doi.org/10.1093/ije/24.3.612

21. Ferrante T, Manzoni GC, Russo M, Camarda C, Taga A, Veronesi L, et al. Prevalence of tension-type headache in adult general population: the PACE study and review of the literature. Neurological Sciences [Internet]. 2013 May 22 [cited 2024 Oct 10];34(S1):137–8. Available from: https://doi.org/10.1007/s10072-013-1370-4

22. Burstein R, Noseda R, Borsook D. Migraine: Multiple Processes, Complex Pathophysiology. The Journal of Neuroscience [Internet]. 2015 Apr 29 [cited 2024 Oct 10];35(17):6619–29. Available from: https://doi.org/10.1523/jneurosci.0373-15.2015

23. De Gaalon S, Donnet A. Headaches during pregnancy. Rev Neurol (Paris) [Internet]. 2021 Mar [cited 2024 Oct 10];177(3):195–202. Available from: https://doi.org/10.1016/j.neurol.2020.05.012

24. Kurth T, Rist PM, Ridker PM, Kotler G, Bubes V, Buring JE. Association of Migraine With Aura and Other Risk Factors With Incident Cardiovascular Disease in Women. JAMA [Internet]. 2020 Jun 9 [cited 2024 Oct 10];323(22):2281. Available from: https://doi.org/10.1001/jama.2020.7172

25. Espinoza J, Vidaeff A, Pettker CM, Simhan H. ACOG PRACTICE BULLETIN. Clinical Management Guidelines for Obstetrician–Gynecologists. OBSTETRICS & GYNECOLOGY [Internet]. 2020 Jun [cited 2024 Oct 10];(6):e237–60. Available from: https://www.preeclampsia.org/frontend/assets/img/advocacy_resource/Gestational_Hypertension_and_Preeclampsia_ACOG_Practice_Bulletin,_Number_222_1605448006.pdf