

## Brainstem Ischemia and Preeclampsia

**Brahim Housni, M.D., Rachida Bayad, M.D., Rachid Cherkab, M.D.,  
Saïd Salmi, Ph.D., M.D., and Mohamed Miguil, Ph.D., M.D.\***

Anaesthesia and Intensive Care Unit, University Hospital Centre of Ibn Rochd,  
Lalla Meryem Maternity, Casablanca, Morocco

### ABSTRACT

Diffuse neurological manifestations of preeclampsia are due to endothelial involvement that lead to ischemia, hemorrhage, or edema. We analyzed clinical and radiological features and the course of brainstem ischemic strokes in a preeclampsia patient. We report a case of severe preeclampsia in a 30-year-old woman who was admitted 10 hr after a vaginal delivery at home. The pregnancy was at 39 wk, with no prenatal care. At her admission, she was conscious, and she had tetraparesia, swinging deep tendon reflex testing, drowsiness, and dysarthria; the BP was at 160/100 mmHg and 4+ proteinuria; magnetic resonance imaging revealed brainstem ischemic stroke. The evolution was favorable with symptomatic treatment. The patient was discharged on the 16th day; 2 months later she had a normal recovery. Brainstem strokes are rare. They are frequently due to hemorrhage; sometimes, they can also be ischemic. Their course is favorable.

*Key Words:* Brainstem; Ischemia; Preeclampsia.

---

\*Correspondence: Pr. Mohamed Miguil, Ph.D., M.D., Anaesthesia and Intensive Care Unit, University Hospital Centre of Ibn Rochd, Lalla Meryem Maternity, P.O. Box 8161, Casablanca-Oasis 20100, Casablanca, Morocco; Fax: 00-212-22-31-19-37; E-mail: housni420@hotmail.com.

## INTRODUCTION

Cerebrovascular affections are a rare complication of preeclampsia. Focal manifestations are symptomatic of either hemorrhagic or ischemic stroke (1,2). Brain involvement is more often a hemorrhagic process than ischemic (3).

We report a case of severe preeclampsia presenting symptoms that advocated an ischemic process of brainstem stroke confirmed by magnetic resonance imaging (MRI). We analyzed clinical and radiological features and the course of brainstem ischemic strokes.

## CASE REPORT

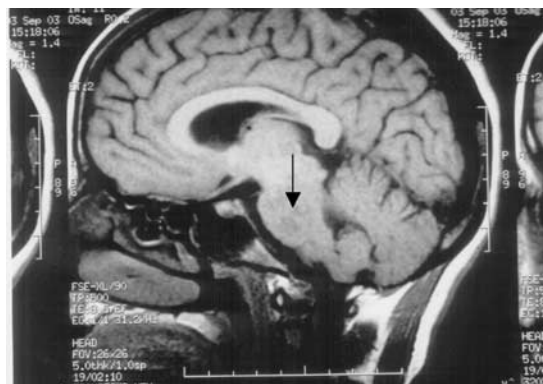
A 30-year-old woman, gestate 3, parity 3, with no medical history, was admitted in our unit 10 hr after vaginal delivery at home of a pregnancy that reached term (39 wk). She had no prenatal care.

Clinical examination showed normal pyretic status with complaints of throbbing occipital headaches, visual disturbance, blood arterial pressure at 160/100 mmHg and proteinuria (4+), suggesting severe preeclampsia.

Neurological examination showed a drowsy patient, horizontal nystagmus, swinging muscle stretch reflexes: ankle jerk, patella, biceps, and triceps. It also denoted slight spastic paraparesia, right indifferent response to Babinski's sign, dysarthria, cerebella dysfunction with no photomotor or corneal dysfunction, no meningeal syndrome, and no sensory dysfunction.

Ophthalmological examination showed macular disease with bilateral grade II papillary oedema. Treatment involved antihypertensive therapy with nicardipine (60 mg/day) and methyl dopa (1500 mg/day).

Biological investigations revealed creatinine and urea blood levels at 256.6  $\mu\text{mol/L}$  and 14.5 mmol/L, respectively, suggesting renal dysfunction. Hemogram showed normochromic normocytic anemia (9.4 g/dL) and thrombopenia ( $55 \times 10^3/\text{mm}^3$ ), which necessitated six platelet concentrates. Fibrin degradation products levels rose to 20  $\mu\text{g/mL}$ .



**Figure 1.** MRI on T1: swelling brainstem with areas of hypointense signal.

and fibrinogen lowered to 2 g/L, with 2++ positive ethanol test as well as low prothrombin complex, suggesting disseminated intravascular coagulation. We also observed a rise of daily total proteinuria (3.1 g/24 hr).

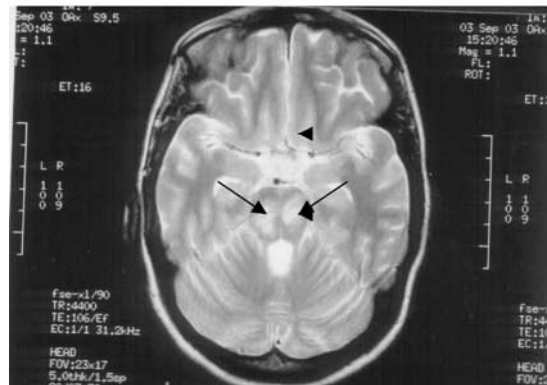
Activated C protein resistance and S protein normal values were 2.8% (normal value >2) and 90% (normal values 70%–140%), respectively.

Computed tomography scanning showed the second day was normal. Magnetic resonance imaging showed a swelling brainstem 2 days after, with areas of hypointense signal on T1 and hyperintense signal on T2, and a flair situated at the level of the two cerebral peduncles (Figs. 1, 2a, and 2b), with no signal trouble at the upper tentorial level, suggesting brainstem ischemic stroke.

The clinical course was characterized by stabilization of blood pressure and regression of neurosensory symptoms and improvement of biological values along with normalization of biological parameters. The MRI assessment was normal. She was discharged on the 16th day. We saw the patient 2 months later and the neurological examination was normal.



a



b

**Figure 2.** (a and b) T2 and flair situated at the level of the two cerebral peduncles.

## DISCUSSION

The incidence of ischemic stroke during peripartum is about 3 to 4/100,000 deliveries (4), which corresponds to 12% of maternal deaths (5,6). Brainstem stroke is rare, due to hemorrhage or ischemia (7). It manifests itself by headaches, vomiting, blindness (8,9), or complex oculomotor dysfunction associated with vigilance troubles (9). Computed tomography scan may be normal, and either MRI or cerebral angiography (1,10,11) confirms diagnosis. In the case reported, diagnosis was confirmed by cerebral magnetic resonance angiography.

Severe preeclampsia induces 47% of all ischemic strokes during peripartum (4,12). Many authors believe that ischemia during severe preeclampsia is due to a vasospasm phenomenon (13,14). Among the other causes is vascular thrombosis in the cerebral artery segment, and thrombophilia research is necessary (1); this examination was negative in the case reported here (antithrombin III and C, S proteins).

Obstetric management of the pregnancy induces most often involution of neurological symptoms. We have noted, in our case, an improvement after a week of treatment, becoming autonomous after 30 days. Recovery was complete by day 60.

Most authors believe that the course of ischemic stroke is most often favorable, with reversibility of all radiological features (9,14,15).

## CONCLUSION

Ischemic stroke is a frequent complication of preeclampsia. However, its location in the brainstem is exceptional, so an accurate diagnosis and adequate management is required. Nevertheless, the prognosis remains good.

## REFERENCES

1. Witlin AG, Mattar F, Baha M. Postpartum stroke: a twenty-year experience. *Am J Obstet Gynecol* 2000; 187:83–88.
2. Witlin AG, Friedman SA, Egerman RS, Frangieh AY, Sibai BM. Cerebrovascular disorders complicating pregnancy beyond eclampsia. *Am J Obstet Gynecol* 1997; 176:1139–1145.
3. Sheehan HL, Lynch JB. *Pathology of Toxaemia of Pregnancy*. Churchill Livingstone: London, 1973:524–553.
4. Sharshar T, Lamy C, Mas JL. Incidence and causes of strokes associated with pregnancy and puerperium. *Stroke* 1995; 26:930–936.
5. Simolke GA, Cox SA, Cunningham FG. Cerebrovascular accidents complicating pregnancy and the puerperium. *Obstet Gynecol* 1991; 78:37–42.
6. Dias K, Sekhar LN. Intracranial haemorrhage from aneurysms and arteriovenous malformations during pregnancy and the puerperium. *Neurosurgery* 1990; 27:855–866.
7. Colosimo C, Fileni A, Moschini M, Guerrini P. CT findings in eclampsia. *Neuroradiology* 1985; 27:313–317.

8. Lau SPC, Chan FL, Yo YL, Woo E, Huang CY. Cortical blindness in toxemia of pregnancy: findings on computed tomography. *Br J Radiol* 1987; 60:347–349.
9. Nighoghossian N, Neuschwander PH, Sonnet ML, Audrat PH, Bouffard Y, Trouillas P. Neurological manifestations in the vertebro-basilar artery territory disclosing gravid toxemia. *Rev Neurol* 1991; 147:830–832.
10. Schwartz RB, Feske SK, Polak JF, DeGirolami U, Iaia A, Beckner KM, et al. Preeclampsia–eclampsia: clinical and neuroradiographic correlates and insights into the pathogenesis of hypertensive encephalopathy. *Radiology* 2000; 217:371–376.
11. Sengar AR, Gupta RK, Dhanuka AK, Roy R, Das K. MR imaging angiography, and MR spectroscopy of the brain in eclampsia. *Am J Neuroradiol* 1997; 18:1485–1490.
12. Wiebers DO. Ischemic cerebrovascular complications of pregnancy. *Arch Neurol* 1985; 42:1106–1113.
13. Lee KY, Sohn YH, Kim SH, Seo H, et al. Basilar artery vasospasm in postpartum cerebral angiopathy. *Neurology* 2000; 54:2003–2005.
14. Trommer BL, Homer D, Mikhael MA. Cerebral vasospasm and eclampsia. *Stroke* 1988; 19:326–329.
15. Keswani SC, Wityk R. Don't throw in the towel! A case of reversible coma. *J Neurol Neurosurg Psychiatry* 2002; 73:83–84.

Copyright of Hypertension in Pregnancy is the property of Marcel Dekker Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.