Case Report

Brain lesions in eclampsia: A series of 39 cases admitted in an Intensive Care Unit

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Abstract

The aim of this study was to identify the encephalic lesions in the eclampsia occurrences. Within a period of 18 months, computed tomography (CT) of the brain was performed in all patients admitted in intensive care for eclampsia. These CTs were analyzed and intracerebral lesions were identified. Thirty-nine patients were included. We noted 10 cases of ischemic stroke, 9 cases of cerebral edema, and 3 cases of hemorrhagic stroke and subarachnoid hemorrhage. The CT scan came back to normal in 20 eclamptic patients. Overall, delays in obstetric and intensive care and time of completion of the CT were long. CT has allowed highlighting in patients with eclampsia varied intracerebral lesions. The early performance of the CT is therefore essential for a better support of patients.

Keywords: Brain computed tomography, brain lesions, eclampsia, HELLP syndrome

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Introduction

Eclampsia is an acute neurological complication of preeclampsia characterized by seizures and/or consciousness disorders which cannot be related to another neurological disease.[1,2] While in developed countries, eclampsia worsens in 1–2% cases of preeclampsia;[1] however, it is a real public health problem in developing countries where eclampsia is an obstetric emergency and common intensive care. Hence, its management requires a multidisciplinary approach,[3] combining, according to the case, obstetricians, pediatricians, anesthetists, and intensive care and emergency agents. In Sub-Saharan Africa, the statistics are alarming. It has been recorded about 20% of maternal mortality in Abidjan and 35% in Senegal.[4,5] Among the morbidity factors, neurological involvement plays a major role. This neurological disease was first described in 1881 by the discovery of cerebral hemorrhage in eclampsia.[6] Recent studies using computed tomography (CT) and magnetic resonance imaging (MRI)[7,8] helped to better understand brain lesions that may occur during an eclampsia. These lesions include intracerebral hemorrhage, cerebral ischemia, and cerebral edema. In Côte d'Ivoire, there are no studies on neuroimaging data in eclampsia patients.

The aim of this study was to identify the types of neurological lesions observed on CT in eclampsia to determine their impact on the prognosis of the patients in terms of survival or death.

Case Series

We report 39 cases of brain lesions in patients admitted to the Intensive Care Unit (ICU) of the University Hospital of Cocody. This is a descriptive, prospective

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study carried out in collaboration with the medical imaging service. It was conducted from January 1, 2012, to June 30, 2013, that is 18 months. The brain CT was performed after parental consent of the patients in whom the diagnosis of eclampsia was confirmed.

For each patient, we collected on a standardized form epidemiological data (maternal age, maternity, parity, gestational age, and origin), clinical data (state of consciousness, blood pressure, deficient signs, and infectious syndrome), biological data (blood count and platelets, transaminases, prothrombin rate, thick smear, bilirubin, blood urea nitrogen, creatinine, proteinuria, and blood gases), interpretation of the brain CT (type, location of lesions), therapeutic data (previous treatment before admission in ICU and that received in ICU: Diazepam, phenol-barbital, antihypertensive, tracheal intubation, mechanical ventilation, sedation, etc.,), and finally fate of patients in terms of length of hospitalization, survival, or success.

One should note that the biological assessment was done according to conventional methods. The CT interpretation was made by the same physician in the imaging unit of the University Hospital of Cocody.

We considered the obstetrical treatment time lapse between the occurrence of the first seizure and expulsion of the fetus and the time of admission of the patient in intensive care. The time of completion of the CT was comprised between the occurrence of the first seizure and the time of completion of the CT scan.

The capture and analysis of the results were performed with Epi Info 2002R2 Windows 9x, NT 4.0, 2000, XP of cdc Atlanta. The quantitative variables were expressed as means matching their dispersion index.

In 18 months, among the 54 patients admitted to the ICU for eclampsia, 39 had brain lesions (72%). Their average age was 24 ± 5.36 years (range, 17–38 years). They had a mean gestational age of 34 ± 2.55 weeks of amenorrhea (range, 27–39 WA). They were mainly primiparous (67%). The prenatal care was regular in 30% of cases. All patients came from surrounding maternity hospitals and admitted to obstetric emergencies. The admission time was 9.88 ± 10.20 h (range, 02–48 h). Among them, 24 patients underwent a caesarean section with general anesthesia. The time of care spent in the ICU was 07.13 ± 4.18 h (range, 03–20 h). The ICU admission reasons were often associated. They were dominated by a disturbance of consciousness with a Glasgow score of <10 (61.5%), high blood pressure >160/100 mmHg (61.5%), subintrant seizures (51.3%), HELLP syndrome (33.3%), pyramidal syndrome (2.5%). A uterine evacuation practice was performed on all patients before admission to ICU. They received an antihypertensive treatment with nicardipine through infusion dose of 1–4 mg/h and diazepam through intravenous infusion at a dose of 0.1–0.3 mg/kg/h.

The timeline for the completion of the CT scan was 42 ± 30 h (range, 6–72 h). Brain lesions were found in 19 patients (48.7%). These were ischemia: 10 cases (25.6%) [Figures 1 and 2], bruising intraparenchymal: 3 cases (7.7%) [Figure 3], and subarachnoid hemorrhage: 1 case (2.5%), cerebral edema: 9 cases (23%) [Figure 4] of which 5 were isolated and 4 associated with ischemia. The locations were variously associated (parietal, parietal-frontal, parieto-fronto-occipital, occipital, and middle cerebral artery.

The CT came back normal in 20 patients (51.3%). In ICU, antihypertensive treatment with nicardipine (2–4 mg/h) was pursued by a syringe pump. The treatment was based on anticonvulsant phenobarbital (200–400 mg intramuscularly) parenteral route or sodium valproate (1.5 g/24 h) by oral route. A tracheal intubation was performed in 30 patients (76.9%) associated with mechanical ventilation in 18 cases. Among them, 4 received neurosedation (midazolam + fentanyl) and the other 14 with mild sedation (midazolam + tramadol). The hospitalization timeline varied from 1 to 14 days with an average of 6.16 ± 3.26 days [Table 1].

Other complications of preeclampsia were HELLP syndrome (13 cases), acute pulmonary edema (2 cases), and renal malfunction (7 cases) of which 2 required dialysis sessions.

We recorded four deaths (10.2%) and they all had HELLP syndrome. Among these deaths, 3 were characterized by a hemorrhagic stroke and 1 by an ischemic stroke [Table 1]. All patients who died exhibited a lobar brain lesion. Recovery was observed in 35 patients (89.7%). One patient exhibited a kind of sequel to the left of the hemiparesis.

Discussion

Our study suffers some limitations related to the low rate of performance of brain CT (72%) and completion timelines that differ significantly (6–72 h). However, it has the advantage of a prospective study as it included a larger number of patients (39 cases) than those reported by other authors (19–34 cases).[5,7,8] Ischemic strokes (10 cases) were the predominant lesions in our study. This observation was found in a series in Canada,[7]

Table 1 : Caractéristiques cliniques et évolutifs des patients selon le type de lésions neurologiques

Lésions	Signes	Délai Moyen (heures)				Durée (jours)	Lésion associée	Evolution
	GSC*	Admission en Obstétrique	Prise en charge obstétricale	Prise en charge en Réanimation	Réalisation du scanner	Hospita-lisation	HELLP syndrome	Décès
AVC H (3 cas)	9	7,5	7,66	3,33	72	7	3 cas	3
AVCI (10 cas)	11	15,81	18	7,90	32	4,6	5 cas	1
Hémorragie Méningée (1cas)	8	4	7	9	24	8	0	0
Œdème cérébral (9 cas)	11	5	9,25	09	50,88	6,66	1 cas	0
Absence de lésion (20 cas)	12	4,56	5,61	6,12	42	3,2	4 cas	0

GSC*: Score de Glasgow moyen en réanimation

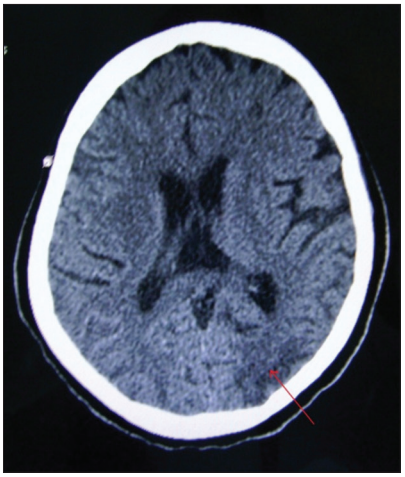

Figure 1: Cortico-subcortical triangular hypodensity well systematized in the left occipital with deletion of grooves opposite (red arrow) corresponding to ischemic lesion in the area of the posterior cerebral in an eclamptic patient of 27 years

Figure 2: Cortico-subcortical hypodensity in internal parietal associated with hemorrhagic reshuffle (red arrow) with deletion of cortical grooves opposite, in the framework of an affection of the posterior branch of the anterior cerebral in an eclamptic patient of 27 years old

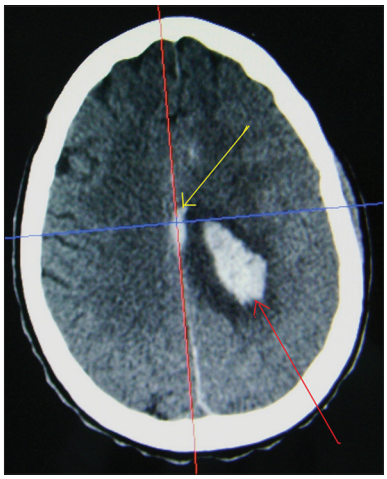

Figure 3: Hyperdense oval spontaneously homogeneous left-hemispheric centro (red arrow) associated with subarachnoid component (yellow arrow) accompanied by a peripheral hypodense halo under acute cerebral subarachnoid hemorrhage in an eclamptic patient of 25 years old

Figure 4: Diffuse deletion of cortical sulci and basal cisterns accompanied by a collapse of the ventricular system with gray-white substance dedifferentiation substance diffuse cerebral edema in an eclamptic patient of 17 years old

which observed 21 cases of cerebral ischemia in 34 patients. However, our results contrast with those of some other authors. Indeed, in France,[8] it has been observed a prevalence of edematous lesions whereas the Taiwanese series,[9] found a prevalence of hemorrhagic stroke. The occurrence of ischemic lesions in eclampsia may have its explanation in the pathophysiology of preeclampsia.[10] Indeed, complex phenomena in the placenta resulting in placental ischemia may be the cause of ischemic disorders in several organs.[2,10] This could partly explain the cerebral ischemic lesions. However, the most frequently cited cause is vasospasm which is the cause of hypoperfusion causing ischemia and/

or cerebral edema.[1] The absence of lesions in CT of 20 comatose patients does not exclude the possibility of brain lesions that could have been diagnosed by MRI. In fact, in the French study, the MRI exhibited some edematous brain lesions in eclamptic patients who had a normal CT scan.[8] In the unit, the antihypertensive treatment with nicardipine. The fight against seizures was based on phenobarbital or sodium valproate because we do not have magnesium sulfate which has a higher efficiency.[2,3] Tracheal intubation was performed in thirty patients associated with mechanical ventilation in 18 cases due to severe vital distress.[2] Among them, 4 received neurosedation and the other 14 received a mild sedation (midazolam + tramadol). In the course of administration of this treatment, 4 patients (10.2%) died. This death rate is similar to a series in Mexico (9%).[7] One series in India[7] reports a death rate of 30%. Patients with intracerebral hematoma have poor prognosis. Indeed, 3 patients who had presented a hemorrhagic stroke died. The literature[7] reported that hemorrhagic strokes during eclampsia have a bad prognosis compared to ischemic stroke. All patients who died in our series also had HELLP syndrome, a severe complication of preeclampsia.[6] HELLP syndrome associated with stroke is a factor of bad prognosis in patients with eclampsia.[6] Coagulation disorders encountered in this condition associated with severe hypertension could explain the occurrence of the stroke H.

Further, this mortality rate can be explained by the clinical features. Patients with hemorrhagic stroke admitted to the ICU exhibited a deeper consciousness disorder (Glasgow score <9), and the timeline for completion of the CT was relatively long (72 h) which was a delay in the adequate care.

Conclusion

Eclamptic patients admitted to the ICU often suffer from various intracerebral lesions. Performing a CT scan would be a contribution to their treatment. Brain scans have an undeniable advantage in the management of eclamptic patients provided that it is performed early.

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Conflicts of interest

There are no conflicts of interest.

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