



Research Article

Maternal Complications and Prognostic Factors of Severe Pre-Eclampsia in Three University Hospitals of Yaoundé: A Study of 115 Cases

Complications Maternelles et Facteurs Pronostiques de la Pré-Éclampsie Sévère dans Trois Hôpitaux Universitaires de Yaoundé : Une Étude de 115 Cas

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ABSTRACT

Introduction. Severe preeclampsia can be life-threatening for both the mother and baby if left untreated, and typically requires immediate medical intervention. The aim of our study was to look at the management of severe pre-eclampsia in 3 hospitals of Yaoundé. **Methodology.** We conducted a descriptive cross-sectional study studying files of patients admitted in intensive care for severe pre-eclampsia and its complications from September 2008 to September 2018 for the retrospective phase and patients with pre-eclampsia and/or its complications admitted in intensive care from the 1st of October 2018 to the 30th of May 2019 for the prospective phase in the intensive care units of the University Teaching Hospital of Yaoundé, the Central Hospital of Yaoundé and the Gynaeco-Obstetric and Paediatric Hospital of Yaoundé. **Results.** Our study concerned 115 cases with a sex ratio of 2,33. The most represented age group was [30-34] years old. The main complications found were; eclampsia (39%), HELLP syndrome (14%) and acute kidney injury (12%). A case of haemorrhagic stroke was diagnosed. Caesarean section was performed in 69% of cases. Nicardipine (92%) and magnesium sulphate (81%) were the main drugs used. The maternal mortality rate was 3.5%. The main factors of poor prognosis were acute pulmonary oedema, Glasgow Coma score < 8, altered liver function and haemoglobin level < 7g/dl. **Conclusion.** Severe pre-eclampsia remains a serious pathology present in our intensive care units. The poor prognostic factors identified could help improve the management of its complications.

RÉSUMÉ

Introduction. La prééclampsie sévère peut être mortelle pour la mère et le bébé si elle n'est pas traitée, et nécessite généralement une intervention médicale immédiate. L'objectif de notre étude était d'examiner la prise en charge de la pré-éclampsie sévère dans 3 hôpitaux de Yaoundé. **Méthodologie.** Nous avons mené une étude transversale descriptive étudiant les dossiers des patientes admises en soins intensifs pour une pré-éclampsie sévère et ses complications de septembre 2008 à septembre 2018 pour la phase rétrospective, et des patientes atteintes de pré-éclampsie et/ou de ses complications admises en soins intensifs du 1er octobre 2018 au 30 mai 2019 pour la phase prospective dans les unités de soins intensifs de l'Hôpital Universitaire de Yaoundé, de l'Hôpital Central de Yaoundé et de l'Hôpital Gynécologique, Obstétrique et Pédiatrique de Yaoundé. **Résultats.** Notre étude a concerné 115 cas avec un sex ratio de 2,33. Le groupe d'âge le plus représenté était [30-34] ans. Les principales complications constatées étaient; l'éclampsie (39%), le syndrome HELLP (14%) et l'insuffisance rénale aiguë (12%). Un cas d'accident vasculaire cérébral hémorragique a été diagnostiqué. Une césarienne a été réalisée dans 69% des cas. Le nicardipine (92%) et le sulfate de magnésium (81%) étaient les principaux médicaments utilisés. Le taux de mortalité maternelle était de 3,5%. Les principaux facteurs de mauvais pronostic étaient l'œdème pulmonaire aigu, le score de Glasgow < 8, le fonctionnement hépatique altéré et le taux d'hémoglobine < 7g/dl. **Conclusion.** La pré-éclampsie sévère reste une pathologie grave présente dans nos unités de soins intensifs. Les facteurs de mauvais pronostic identifiés pourraient aider à améliorer la prise en charge de ses complications.

INTRODUCTION

Pre-eclampsia is defined as the occurrence after the 20th week of gestation of a new-onset hypertension associated to proteinuria $\geq 0.3\text{g}/24\text{H}$ [1]. However, we speak of

severe pre-eclampsia when pre-eclampsia is associated with at least one severity criterion, namely: SBP ≥ 160 mm Hg and/or DBP ≥ 110 mm Hg, eclampsia, acute pulmonary oedema, persistent headache or visual disturbances, epigastric pain or right hypochondriac pain,

oliguria < 500 ml/24 hours, 24 hour proteinuria \geq 0.5 grams, elevated serum creatinine (100 mmol/l), AST > 70 IU/L, haemolysis (presence of schistocytes), or LDH > 600 U/l, platelet count < 100,000/ μ l, oligohydramnios or intrauterine growth retardation [2].

HIGHLIGHTS

What is known of the subject

Maternal and perinatal mortality rates due to severe forms of pre-eclampsia are respectively estimated at 4.43% and 21.5%

The aim of our study

Management of severe pre-eclampsia in 3 hospitals of Yaoundé

Key Results

1. The sex ratio was 2, 33. And the most represented age group was [30-34] years old.
2. The main complications found were; eclampsia (39%), HELLP syndrome (14%) and acute kidney injury (12%).
3. The maternal mortality rate was 3.5%.
4. The main factors of poor prognosis were acute pulmonary oedema, Glasgow Coma score < 8, altered liver function and haemoglobin level < 7g/dl.

Severe pre-eclampsia represents approximately 3.6% of cases of pre-eclampsia [3]. As a result, the resulting maternal complications are; eclampsia, stroke, acute kidney injury (AKI), HELLP syndrome, placental abruption and acute pulmonary oedema [4]. In Cameroon, 72.3% of parturients admitted in intensive care in 2017 presented with a severe form of hypertension in pregnancy [5]. Maternal and perinatal mortality rates due to severe forms of pre-eclampsia are respectively estimated at 4.43% and 21.5% [6]. For this purpose, we proposed to conduct a study on severe pre-eclampsia and its maternal complications at the intensive care units of Yaoundé. The aim of our study was to look at the management of severe pre-eclampsia and its maternal complications in intensive care units in our setting.

PATIENTS AND METHODS

We carried out a descriptive and analytical cross-sectional study with prospective and retrospective data collection at the intensive care units of the University Teaching Hospital of Yaoundé, the Central Hospital of Yaoundé and the Gynaeco-Obstetric and Paediatric Hospital of Yaoundé. It concerned the files of patients admitted in intensive care for severe pre-eclampsia and its complications from September 2008 to September 2018 for the retrospective phase and patients with pre-eclampsia and/or its complications admitted in intensive care from the 1st of October 2018 to the 30th of May 2019 for the prospective phase, after obtaining informed consent. The variables collected were; the sociodemographic and clinical characteristics of the patients, the results of the paraclinical examinations carried out, the various complications, the various protocols for the management of severe pre-eclampsia and its complications (conditioning and specific measures: delivery mode, treatment of hypertension,

treatment of AKI, treatment of acute pulmonary oedema, management of HELLP syndrome, management of stroke), clinical and paraclinical monitoring and maternal outcome. The data collected was reported on a survey sheet and entered into a computer using Cs Pro 7.0 software. Data analysis was performed using SPSS 20.0 statistical software.

RESULTS

We included 115 patients in our study. The mean age \pm SD was 28.41 ± 7.01 years. The majority of participants were in the age group 30-34 years (Table I).

Table I. Distribution of patients according to age groups

Age group	N	%
15-19	18	15,7
20-24	18	15,7
25-29	24	20,9
30-34	29	25,2
35-39	22	19,1
40-44	4	3,5
Total	115	100

Most participants were students (27.8%) (Table II).

Table II. Distribution of patients according to occupation

Occupation	N	%
Student	32	27,8
Housewife	31	27
Informal sector	27	23,5
Formal sector	25	21,7
Total	115	100

The primiparous women were the most affected (33%), followed by the pauciparous (32%). Multiparas and grand multiparas accounted for 18% and 17% of cases respectively. In addition, we found in 8.7% of patients a personal history of pre-eclampsia and a family history of hypertension in 18% of cases. The gestational age varied from 25 weeks to 42 weeks with mean \pm SD of 35.2 ± 3.58 weeks. The pregnancies were single in 89.57% of cases and twins in the other 10.43%. On admission, the systolic blood pressure of participants ranged from 120 mmHg to 260 mmHg with a mean \pm SD of 175.75 ± 24.72 mmHg and the diastolic blood pressure from 60 mmHg to 180 mmHg with a mean \pm SD of 113.59 ± 19.60 mmHg. In addition, the mean Glasgow Coma Score \pm SD of our participants on admission was 14.23 ± 1.68 with range of 6 to 15. Headache was the most common clinical manifestation (45.2%) of severe pre-eclampsia, while convulsions predominated among the complications. (Figure 1). Altered liver function was the main biological abnormality (21%) A brain CT scan was requested in our sample, highlighting a cerebral haemorrhage. (Figure 2). Complications occurred in 51% of cases in our study. Eclampsia was the main complication (39%). HELLP syndrome, AKI, acute pulmonary oedema and placental abruption were found respectively in 14%, 12%, 3% and 2% of cases. However, combinations of complications were found in

30% of cases. A case of haemorrhagic stroke was diagnosed in association with HELLP syndrome and placental abruption (**Figure 3**).

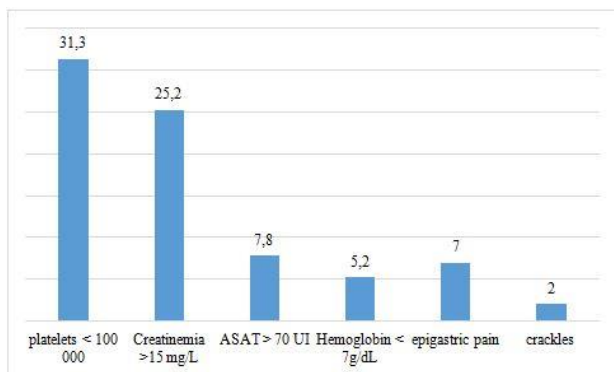


Figure 1. Clinical manifestation of complications

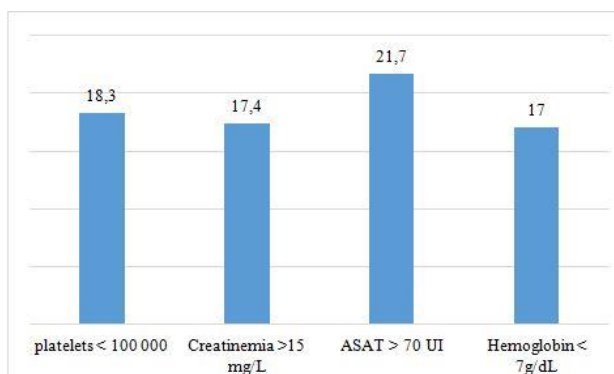


Figure 2. Biological data

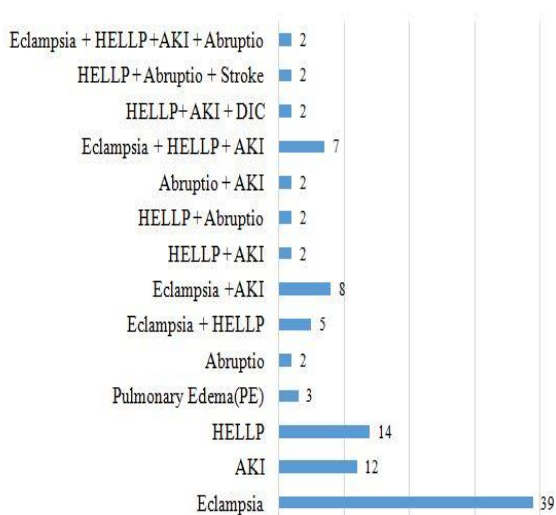


Figure 3. Complications of severe pre-eclampsia

The patients in our sample were installed in quiet rooms, of which 50% of them were placed in the prone position. Prevention of venous thromboembolic disease was carried out in 73% of patients with use of LMWH in

62% of cases. In addition, 79% of patients received analgesics, predominantly the Tramadol + paracetamol combination in 53% of cases. Oxygen therapy was necessary in 33% of the patients and vascular filling was performed mostly with normal saline 0.09% (90.2%). Caesarean section was the most frequent mode of delivery (69%). The management of hypertension was mainly with the combination alpha-methyldopa + nicardipine (53.5%) followed by the triple therapy alpha-methyldopa + nicardipine + labetalol (25.4%) (**Figure 4**). However, we noted that nicardipine was the most commonly used antihypertensive in general (92%).

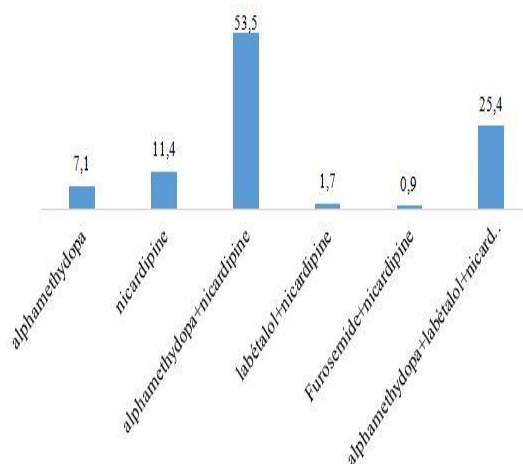


Figure 4. Antihypertensive drugs used

Magnesium sulphate is the most used anticonvulsant (81%) in the treatment of eclampsia. Fresh frozen plasma and whole blood were used in patients with coagulopathy in 24% and 19% of cases, respectively. However, vascular filling based on normal saline 0.09% was the main therapeutic modality in AKI (85%). It was also noted that 35% of patients received a diuretic after the fluid replacement trial and no patient in our study required haemodialysis. The opinion of a nephrologist was required in all cases. In the management of acute pulmonary oedema, furosemide and oxygen therapy were used in 100% of cases. Haemorrhagic stroke was treated with nicardipine to stabilize blood pressure and nimodipine to prevent vasospasm. Four patients out of 115 cases died, giving a maternal mortality rate of 3.5%. The aetiologies of maternal death were predominantly acute pulmonary oedema and HELLP syndrome. The poor prognostic factors found were; the occurrence of signs of acute pulmonary oedema, altered consciousness with GCS <8, altered liver function (AST>70 IU/L) and a haemoglobin level < 7g/dl (**Table III and IV**).

Table III. Poor prognostic factors according to qualitative variables

Factors	Pearson's chi-square value	P-value
Blurred vision	0.269	0.604
Headaches	0.168	0.664
Convulsions(complications)	0.036	0.849
Altered consciousness	85.480	0.000
Lower limb oedema	0.111	0.739
Orthopnea	27.993	0.000
Tachypnea	27.993	0.000
Bilateral crackles	27.993	0.000

Table IV: Poor prognostic factors according to quantitative variables

Factors	T Stat	P-Value
Platelet Count <100.000/Mm ³	-0.3522	0.7254
Serum Creatinine >15 Mg/L	-0.0687	0.8760
Ast>70iu/L	-1.7597	0.0406
Haemoglobin Level <7	-4.3460	0.0000
Gcs <8	-83.8210	0.0000

DISCUSSION

Women aged 30 to 34 years were the most affected by severe pre-eclampsia. These results are similar to those observed in another study in Cameroon where the pathology was more frequent among the 29-33-year-olds [6]. Student status was the main occupation, which differs from the results of certain studies where women working in the informal sector were predominant [7]. This can be explained by the difference in sample size which could have an impact on the results. Primiparity, which is an established risk factor for pre-eclampsia, was found in 33% of cases. Tshabu-Aguemon et al. in Benin in 2014 [7] and Ngbale et al. in the Central African Republic in 2019 [8] had also found a predominance of primiparous in their studies, i.e. 65% and 53.6% of their respective populations. The average SBP of the patients on admission was 175.75 ± 24.72 mm HG and the DBP 113.89 mm HG, results substantially identical to those of Tchaou B et al. in 2012 [9] who found an average SBP of 182.2mm HG and a DBP of 110.8 mm HG. The high blood pressure values in these two studies could be explained by the absence of administration of antihypertensives before admission to the hospital. Headache was found in 45.2% of patients in our study. Issa et al. in a study conducted in 2018 [10] showed that 51% of patients had headache on admission. Indeed, the very high blood pressure values on admission would be the cause of the headaches. In addition, 31.3% of our patients had convulsions on admission. The average Glasgow Coma Score was 14.23 ± 1.68 . Tchaou B et al. in Cotonou [9] had superimposable results with a frequency of convulsion of 31.1% and an average GCS of 13.2 ± 1.2 thus justifying the place of eclampsia as the main complication. Eclampsia was the most common maternal complication in our study (39%), justified by the high

frequency of convulsions and impaired consciousness as presented above. This result corroborates with that of Ngbale et al. in the Central African Republic [8] where eclampsia was the major complication (29.3%) or that of Tshabu-Aguemon et al. in Benin (36.8%) [7]. Nicardipine was the most used antihypertensive (92%). It was also found in a study in Douala (Cameroon) in 69.6% [6] while Issa et al. in Burkina Faso in 2012 [10] and Tshabu-Aguemon et al. in 2017 [7] instead found clonidine in 99.6% and 51.6% of their respective studies. This difference between the different studies could be explained by the availability and cost of antihypertensives in each country. However, the SFAR society recommends to use nicardipine for the attack treatment of arterial hypertension, labetalol and clonidine being alternative drugs [11]. Magnesium Sulphate, recommended for the prevention of convulsions by WHO [12], was administered in our study in 81% of cases. These results corroborate to those of Issa et al. (86.6%) [10]. Furosemide was necessary in 35% of AKI cases after vascular filling trial. Dialysis was not necessary in any case of AKI, especially due to the fact that the use of dialysis is only considered in the event of persistent oligo-anuric renal injury or hydro-electrolyte abnormalities threatening the vital prognosis after foetal extraction [11]. Caesarean section was performed in 69% of cases in our study. A study conducted in Douala in 2015 [6] showed a Caesarean section rate of 57.5%. These results could be explained by the availability of emergency Caesarean kits in each health facility where the studies were conducted. We found a maternal mortality rate of 3.5% while Nguefack et al. in 2015 had a rate of 4.4% [6] and Issa et al. [10] a rate of 1.92%. The poor prognostic factors established were; altered consciousness with a GCS < 8, anaemia, signs of acute pulmonary oedema and altered liver function. A study in Douala [6] also found acute pulmonary oedema as a negative factor, while Tchaou B et al. [9] also presented a GCS <8 as poor prognostic factor.

CONCLUSION

Severe pre-eclampsia remains a fairly frequent pathology in intensive care units in our setting. The frequency of complications and the maternal mortality rate remain high, testifying to a perpetual need to improve the care of women with pre-eclampsia while placing particular emphasis on prevention.

Limits

- The lack of digitization of the archive system making it difficult to access patient files
- The exclusion of many incomplete files in the retrospective phase, thus reducing our sample
- The insufficient financial means of certain patients seen during the prospective phase preventing them from doing all the paraclinical investigations necessary for a good care and resulting in their exclusion from our study, and therefore, difficulties in better describing the pathology.

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