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Management of Eclampsia and Pre-Eclampsia in the Intensive Care Unit of N'Djamena Mother and Child University Hospital

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Abstract

Introduction: Severe pre-eclampsia is a condition specific to pregnancy characterized by the onset of high blood pressure with systolic blood pressure (SBP) ≥ 160 mmHg and/or diastolic blood pressure (DBP) ≥ 110 mmHg, with or without 24-hour proteinuria ≥ 300 mg/24 hours or urine dipstick ≥ 1+, occurring from the 20th week of amenorrhea (WA) in a normotensive pregnant woman, associated with maternal-foetal complications. Eclampsia is the neurological complication of PE. **Objective**: improve the management of PE and eclampsia. **Patients and Method**: This is a descriptive cross-sectional study performed during the period from October, 1st 2022 to September, 30th 2023. We conducted an exhaustive collection of the files of all patients admitted to the obstetric intensive care unit of N'djamena Mother and Child University Hospital with severe pre-eclampsia or eclampsia, regardless of when the crisis occurred. Data were collected and analyzed using SPSS and Excel software. **Results**: We collected 217 cases of severe pre-eclampsia (PE) and eclampsia in our series, which accounted for 8.1%. The median age was 28.1 ± 8.6 years, with extremes of 16 and 44 years. For the treatment, the antihypertensive drug based on nicardipine and magnesium sulphate was respectively used in 74.2% and 77%. The mode of delivery was predominantly caesarean section in 77.4% of cases 168) compared to 22.6% (n = 49) by vaginal delivery. On the maternal side, the prognosis was favorable in 76% and 24% had had complications. Foetal complications were dominated by prematurity at 9.7%. We reported a maternal mortality rate of 3.2% (n = 7). **Conclusion**: PE and eclampsia are common conditions in our setting. Antihypertensive drugs, corticosteroids and, above all, obstetric treatment involving caesarean section or vaginal delivery are widely used.

Keywords

Eclampsia/Pre-Eclampsia, Resuscitation, CHUME, N’Djamena, Chad

1. Introduction

Severe pre-eclampsia is a condition specific to pregnancy characterized by the onset of high blood pressure with a systolic blood pressure (SBP) ≥ 160 mmHg and/or a diastolic blood pressure (DBP) ≥ 110 mmHg, with or without 24-hour proteinuria ≥ 300 mg/24hours or urine dipstick ≥ 1+, occurring from the 20th week of amenorrhea (WA) in a normotensive pregnant woman, associated with maternal-foetal complications [1]. Eclampsia (E), a major neurological complication of severe pre-eclampsia (SPE), is defined as convulsive manifestations and/or disturbances of consciousness occurring in the context of SPE and not attributable to a pre-existing neurological problem [2]. They are the leading causes of maternal and fetal morbidity and mortality, constitute major obstetric emergencies, and are an indication for emergency fetal extraction to save the mother’s life [1].

To help reduce maternal mortality from eclampsia, the WHO has developed a four-pronged strategy: early screening during prenatal consultations for all pregnant women, anticonvulsant and antihypertensive therapy for detected cases, and uterine evacuation depending on the stage of pregnancy and the severity of the condition [2].

Its treatment has been well codified since the use of magnesium sulphate in therapeutic protocols. However, maternal and especially perinatal morbidity and mortality from eclampsia remain high [3]-[5]. PE and eclampsia therefore constitute a major public health problem and are sources of social crisis in poor countries, particularly in their severe form, due to their frequency and the seriousness of their complications.

In view of all these factors, Chad is not spared from this scourge. Given the frequency of pre-eclampsia and the lack of studies conducted in Africa, especially in Chad and particularly In N’Djamena Mother and Child University Hospital on these pathologies, we have initiated this work to make our modest contribution to updating the data. The issue of managing severe pre eclampsia and eclampsia around the world, especially in Africa and particularly in Chad, remains relevant, given the maternal and fetal mortality rates recorded each year, hence the importance of this work, which sets itself the following objective to improve the management of severe preeclampsia and eclampsia.

2. Patients and Method

This is a descriptive cross-sectional study covering a one-year period from 1st October 2022 to 30th September 2023. The study population consists of all patient records admitted to the adult intensive care unit at CHU-ME.

We included in this series all parturients admitted to the adult intensive care unit for PES or eclampsia, regardless of when it occurred in relation to delivery.

- The diagnosis of eclampsia was based on the occurrence of generalised seizures in a pregnant woman presenting with PES defined according to the following criteria:

- Systolic blood pressure (SBP) ≥ 160 mmHg and/or diastolic blood pressure (DBP) ≥ 110 mmHg;
- Proteinuria ≥ + on dipstick test;
- Gestational age > 20 weeks.

We conducted an exhaustive review of the records of all patients admitted to the obstetric intensive care unit of the CHU-ME with PES or eclampsia, regardless of when the seizure occurred. The variables studied were therapeutic and progressive:

- Maternal age
- Types of care received
- Length of stay
- Progression and prognosis

Data were collected using a pre-established data collection form. These data were entered using Word 2013 and Excel 2013 software. The results were presented in the form of tables, pie charts and figures.

3. Results

3.1. Frequency

During the study period, we collected 217 cases of severe pre eclampsia and eclampsia out of a total of 2664 admissions to adult intensive care, representing a frequency of 8.1%. We recorded 126 patients admitted for severe pre eclampsia, representing 4.7% of cases, and 91 patients admitted for eclampsia, representing 3.4% of cases.

3.2. Maternal Age

The median age was 28.1 ± 8.6, with extremes ranging from 16 to 44 years. The 16 - 20 age group was the most represented, accounting for 28.2% (Table 1).

Table 1. Distribution of patients according to age group.

Age	n	%
16 - 20	61	28.2
21 - 24	57	26.3
25 - 29	29	13.3
30 - 34	47	21.6
≥35	23	10.6
Total	**217**	**100**

3.3. Origin

In 91.1% (n = 202) of patients came from urban areas and 6.9% (n = 15) from the city.

3.4. Level of Education

Patients with no schooling accounted for 65.9% (n = 143), followed by those with primary, secondary and university education, accounting for 23.5% (n = 51), 3.7% (n = 8) and 6.9% (n = 15) respectively.

3.5. Mode of Admission

Patients were transferred/referred in 55.3% (n = 220) of cases and 44.7% came on their own.

3.6. Signs of Severity

Headache was noted in 54.5% and in 67.3% of cases, pre-eclampsia was severe (Table 2).

Table 2. Distribution of patients according to signs of severity.

Other signs of severity	n	%
Headaches	118	54.5
Massive proteinuria	1	0.5
Vivid ROT	32	14.7
Dizziness	32	14.7
Nausea and vomiting	14	6.5
Epigastric pain	12	5.5
Visual impairment	13	6
Hearing impairment	6	2.8
IUGR	1	0.5
MFIU	1	0.5
Oligoamnios	4	1.8

3.7. Therapeutic Aspects

Treatment was based on Nicardipine (74.2%) and Magnesium Sulphate (77%) (Table 3).

Table 3. Distribution of patients according to treatment.

Traitement	n	%
Antihypertensive		
Nifedipine (Adelate)	101	46.5
Nicardipine (Loxen)	161	74.2
Methyldopa (Aldomet)	133	61.3

Continued

Anticonvulsants		
Magnesium sulphate	167	77
Diazepam	105	48.4
Thromprophylaxis	167	77
Ventilation	73	33.6
Blood product transfusion	44	20.3
Restoration of diuresis	6	2.8

3.8. Mode of Delivery

Caesarean section was the predominant mode of delivery, accounting for 77.4% (n = 168) compared with 22.6% (n = 49) for vaginal delivery.

3.9. Maternal Complication

The prognosis was favorable in 76% of cases and complications occurred in 24% of cases (Table 4).

Table 4. Distribution of patients according to Maternal complication.

Maternal complications	n	%
Abruptio placenta	2	0.9
HELLP syndrome	7	3.2
Intra vascular dissemating coagulation	2	0.9
Acute pulmonary oedema	23	10.6
Acute urinary deficiency	11	5.1
None	**165**	**76**
Multiple eclampsia crisis	7	3.2
Total	217	100

3.10. Fetal Complications

Fetal complications were dominated by prematurity, accounting for 9.7% (Table 5).

Table 5. Distribution of patients according to fetal complications.

Complications	n	%
Prematurity	**21**	**9.7**
Intra uterine growth restriction	20	9.2
Fetal asphyxia	16	7.3
Aucun	160	73.7
Total	217	100

4. Discussion

We recorded that 74.2% of patients had received an antihypertensive drug. This result is almost identical to that found by Obame [6] who noted 96% of the hypertensive drug use. The use of nicardipine alone as first-line treatment was justified by its availability in our departments and various pharmacies, as well as its effectiveness and affordability. Anticonvulsant treatment was effective in 77.0% of patients. The anticonvulsant used was mainly magnesium sulphate. These results are similar to the 80.4% found by Obame [6]. Magnesium sulphate was chosen because it is the first-line anticonvulsant in the preventive and curative treatment of eclampsia, but also because it is available in our departments and pharmacies. Its vasodilatory action is also beneficial for blood pressure management [7] [8]. Mechanical ventilation was necessary for 33.6% of patients with a Glasgow score of 8 or less, which was also the case for Hin in 2007 [5] with 42 parturients. In this series, 20.3% of patients required a blood transfusion, which corroborates the rate reported by Hin in 2007 [9] (25.7%) and Danmadji [10] in Dakar, Senegal, in 2015 (14.7%).

Speaking of childbirth, the only curative treatment for SPE or eclampsia is uterine evacuation, either vaginally or by caesarean section. In our series, vaginal delivery was observed in 22.6% of cases. Caesarean section was performed in 77.4% of our patients. This rate is higher than that reported by Hin in 2007 [9], where 67% of deliveries were by caesarean section. The high rate of caesarean sections in these studies was also linked to severe forms of pre-eclampsia, which represented a medical and obstetric emergency. In such cases, emergency uterine evacuation is a matter of saving the life of the mother and/or foetus. Analysis of our records shows, at first glance, that obstetric care was urgent and caesarean sections were not prophylactic, which could be understood in our region due to delays in referral or in the decision to evacuate. The majority of women in labour were evacuated during the complication phase.

In terms of prognosis, the prognosis was favourable in 76% of cases under treatment with gradual normalisation of blood pressure. We recorded 52 cases of complications, or 24%. The complications were distributed as follows: acute pulmonary oedema was the most common complication (10.6%), followed by acute renal failure (5.1%) and HELLP syndrome (3.2%). These results are similar to those of Elombia [11], who found complications in 25.4% of cases. These complications were dominated by renal failure and HELLP syndrome in 38.9% and 22.2% of cases, respectively. In our series, maternal mortality was 3.2% lower than that reported by Elombia [11], with a mortality rate of 14.1%. The main causes of death were haemorrhage and ARF in 50% and 30% of cases, respectively. This low rate is due to the multidisciplinary care our patients received, with upstream collegial management between obstetricians and anaesthetists-resuscitators and downstream systematisation of post-operative care in intensive care. However, it is possible to achieve even lower mortality rates; mortality from PES or eclampsia is preventable. In some developing countries [12]-[15].

Most maternal deaths and complications are due to a lack of prenatal care, a lack of human resources and equipment, delayed diagnosis and inappropriate management of patients with pre-eclampsia, as the target blood pressure is often not determined before treatment begins. Preventive measures such as salicylic acid and calcium prophylaxis, prophylactic caesarean section, and early and adequate management of complications would help to significantly reduce or even eliminate pre-eclampsia-related morbidity and mortality [16].

The foetal prognosis was favourable in 92.6% of live births without sequelae, and early neonatal mortality was 7.4%. Foetal losses are significant in PE, especially when complicated by prematurity.

5. Conclusions

PE and eclampsia are common conditions at CHUME. Management involves obstetric treatment, drug treatment, and surgical treatment. This treatment depends on the stage of pregnancy and, above all, on the condition of the mother and/or foetus.

Despite the available treatment, the progression of severe pre-eclampsia and eclampsia is fraught with maternal and foetal complications. Reducing the prevalence of PE requires high-quality antenatal care during which risk factors can be identified.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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