

Case Series

Severe Preeclampsia Epidemiological, Diagnostic, Therapeutic and Prognostic Aspects at the Thies Regional Hospital Center about 443 Cases

Thiam M^{1,2*}, Gueye L^{1,2}, Mambou B^{1,2}, Faye NA^{1,2}, Mahamat M¹, Diop AP¹, Sylla C^{1,2} and Cissé ML^{1,2}

¹Department of Gynecology-Obstetrics, Regional Hospital of Thies, Senegal

²Training and Research Unit in Health Sciences, University of Thies, Senegal

***Corresponding author:** Thiam Mariétou, Teacher researcher at the Training and Research Unit in Health Sciences, University of Thies, Senegal; Obstetrician Gynecologist at the Department of Gynecology-Obstetrics, Regional Hospital of Thies, Senegal

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Abstract

Objectives: Are to study the epidemiological, diagnostic, therapeutic and prognostic aspects of severe pre-eclampsia in the Obstetrics Gynecology Department of the Regional Hospital of THIES.

Materials and Methods: This were a prospective, descriptive and analytical study of patients received for PES at the Maternity Department of the Regional Hospital of Thies between June 20, 2015 and June 20, 2017. We studied the diagnostic, epidemiological, therapeutic and prognostic aspects. The data were entered and analyzed by the EPINFO software version 6.04dfr. In order to study the influence of certain prognostic factors, we used the comparison of proportions and the Chi-square test with a significance level of 0.05.

Results: We recorded 443 cases of Severe Preeclampsia (SEP) out of 15,744 pregnant women, i.e. a frequency of 2.81%. It represented 52.05% of all hypertensive states associated with pregnancy during the study and a frequency of 3.12% of deliveries. The typical epidemiological profile found was that of a young woman aged 20-24 (25.05%), married (91.19%), housewife (80.8%) from the commune of Thies (50.56%), primiparous (52.37%), carrier of a single pregnancy (96.4%), followed in a health post (97.21%) and evacuated in 89.4% of cases. The time between admission and delivery was on average 3.85 ± 3.91 days with extremities ranging from 0 to 42 days. The main signs found were: headache (96.61%), hypertension with SBP $\geq 160/110$ mmHg (93.90%), edematous syndrome (90.29%), proteinuria on the test strip $\geq ++$ (95.48%), hyper uricemia >60 mg/l (66.13%). Therapeutically, calcium channel blockers were the main antihypertensive agent used (99.32%). Magnesium sulfate was administered to almost all patients (97.29%). Corticosteroids were administered to 223 patients (50.23%). The blood transfusion had been done in 45 patients or 10.08%, and 05 of our patients had presented an acute renal failure requiring a transfer to Dakar for dialysis. Fetal evacuation was performed by Caesarean section in 49.88% of cases. Maternal complications were dominated by: eclampsia (24.78%), retro-placental hematoma (3.61%) and Hellp syndrome (3.61%). We recorded 18 cases of maternal death, i.e. a specific lethality of 4.06% and 69 cases of neonatal death, or a perinatal mortality rate of 4.87 per 1000 live births. On the fetal side, the main complications were fetal hypotrophy (51.46%) and prematurity (41.08%). The main factors of poor maternal prognosis were young age (20-24 years), primi gestity and primiparity. The fetal risk factors included prematurity and the low Apgar score.

Conclusion: Maternal and fetal mortality linked to severe pre-eclampsia remains high, hence the need for constant improvement in its management.

Keywords: Management Severe pre-eclampsia; Complications; THIES

Introduction

According to the World Health Organization, preeclampsia remains the first common etiology of hypertension in pregnant women with a prevalence of 2-6% [1,2]. It is the leading cause of maternal mortality during pregnancy in developed countries and the third leading cause in Africa after hemorrhages and infections [3]. In black Africa, in general, this prevalence is still poorly assessed; only hospital statistics are available with rates varying from 2.8 to

6.1% of deliveries [4-6]. In Senegal, several studies have been carried out on this subject and the most recent date from 2019 as reported by El Hasnaoui with a prevalence of 9.18% [6]. We carried out this study to take stock of the epidemiological, diagnostic, therapeutic and prognostic aspects of this pathology in the maternity ward of the Regional Hospital of Thies in Senegal.

Methodology

This was a prospective, descriptive and analytical study concerning

all the patients received for PES in the Obstetrics Gynecology department of the Regional Hospital of Thies between June 20, 2015 and June 20, 2017. All the parturients admitted were included. In the service and which meet the definition of a SEP and with or without convulsive seizures. Non-pregnant patients hospitalized in the department for another pathology and presenting hypertension were excluded from the study. The diagnostic, epidemiological, therapeutic and prognostic aspects were studied. We used a survey sheet, the shortcomings of which were improved after a pre-test. The data were entered and analyzed using the EPI INFO software in version 6.04dfr. The different percentages were compared using the χ^2 (Chi-square) test and the means were compared using Student's "t" test. An odds ratio was estimated for each variable to identify a possible risk factor for hypertension and pregnancy. For all tests $p < 0.05$ was considered statistically significant.

Descriptive and Analytical Results

Frequency

We recorded 443 cases of PES out of 15,744 pregnant women, i.e. a frequency of 2.81%. It represented 52.05% of all hypertensive states associated with pregnancy during the study with a frequency of 3.12% of deliveries.

Sociodemographic characteristics

Age: The mean age of the patients was 28.07 years with a standard deviation of 8.6. The extremes were 14 to 53 years and the median 33.2 years. The patients mainly belonged to the age group of 20-24 years (25.05%) as shown in Figure 1 below.

Marital status, origin and profession of patients: Regarding marital status, 91.19% were married and came mainly from the municipality of Thiès (50.56%). Concerning the profession of the patients, 63.86% were housewives.

Gesture-parity: The mean gestity was 2.23 with a standard deviation of 1.47. The extremes were 1 to 22 gestures and the median 1 gesture. The patients were mainly primigravidae, i.e. 50.56%. The average parity was 1.80 with a standard deviation of 2.05. The extremes were 0 to 22 pares and the median of a par. The patients were essentially first-time mothers, i.e. 52.37%, as shown in the figure below.

Clinical and paraclinical aspects

The mean age of pregnancy at admission was 33.8 weeks amenorrhea (WA) with a standard deviation of 3.2. The extremes were 22 to 43. The median was 36 weeks amenorrhea. The mean number of antenatal consultation was 3.28 ± 1.05 with extremes of 0 to 6 antenatal consultation. The median was 3 antenatal consultation. The mean age of discovery of hypertension was 34.8 ± 3.8 weeks with extremities ranging from 22 to 43 weeks. The median was 36 weeks. The age of discovery of hypertension was between 36-39 weeks in more than half of the women (65.3%). The functional signs were dominated by: headache (96.61%), severe hypertension with arterial pressure (BP) $\geq 160/110$ mmHg (93.90%). The other signs were edematous syndrome (90.29%), visual blurring (59.36%), vomiting (45.37%), and epigastric pain (22.21%). One hundred and forty-six patients presented with eclampsia (24.78%). The biological signs were dominated by: albuminuria $\geq ++$ (95.48%), hyper uricemia >60 mg/l (66.13%), anemia (34.98%), elevation of transaminases (26.41%), and

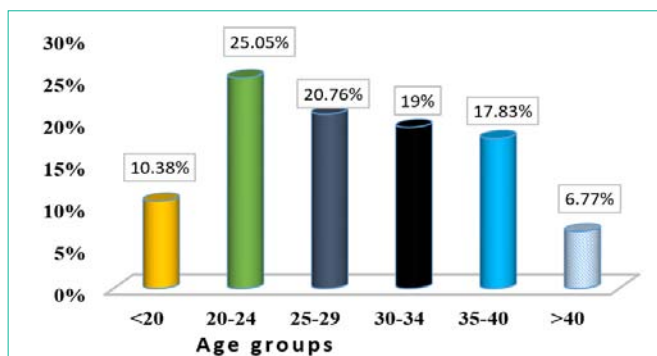


Figure 1: Distribution of patients by age group.

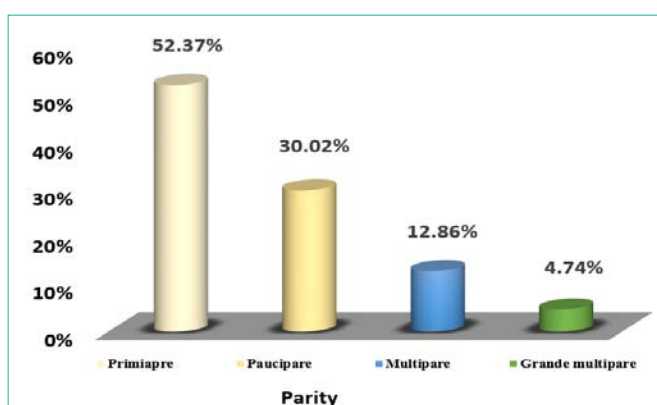


Figure 2: Distribution of patients according to Parity.

serum creatinine (18.96%). In addition, obstetric ultrasound found intrauterine growth retardation (IUGR) in 4.520% of cases and oligoamnios 4.06% of cases.

Support

Nicardipine was the most commonly administered antihypertensive agent in almost all patients (99.32%) and diuretics in 04 patients (0.90%). Corticosteroids were administered to 223 patients, i.e. 50.23%. More than three in four patients (77.5%) had received anticonvulsant therapy. The two most widely used molecules were magnesium sulfate (97.29%) and diazepam (35.4%). Regarding obstetric care, the mean term from pregnancy to childbirth was 37.01 weeks with a standard deviation of 3.7. The mean time from admission to childbirth was 2.68 ± 3.85 days with extremes of 0 to 42 days. The median was 1 day. Half of the patients had given birth by caesarean section (49.88%), and vaginally (48.53%). Forty-five patients or 10.08% had been transfused. Ninety-six patients or 32.94% had been transferred to intensive care. The reasons for the transfer were related to complications such as HELLP syndrome, eclampsia and Acute Renal Failure (AKI). Five patients were transferred to Dakar for reasons of kidney failure.

Materno-fetal prognosis

Eclampsia appears to be the most frequent complication with a frequency of 24.78% of cases, followed by HELLP syndrome (3.61%) and HRP (3.61%), as shown in the table below (Table 1).

We recorded 95.93% cure and 18 cases of maternal death (4.06%). The main cause of death was eclampsia with a frequency of 61.11%

Table 1: Distribution of patients according to maternal complications.

Complications Kindergarten	Frequency absolute (n)	Frequency Relative (%)
Eclampsia	146	24.78
Hellp syndrom	16	3.61
Retroplacental hematoma	16	3.61
Acute lung edema	12	2.70
Acute kidney failure	5	1.12

Table 2: Distribution by cause of maternal death.

Causes of death	Absolute frequency (n)	Relative Frequency (%)
Eclampsia	11	61.11
Hellp Syndrom	3	16.66
Retroplacental hematoma	3	16.66
Acute lung edema	1	5.55

(Table 2).

The fetal complications were mainly hypotrophy (51.46%) and prematurity (41.08%). Fetal development between day 1 and day 6 of life resulted in 15.57% deaths.

The different serious risk factors were: young age 20-24 years (OR = 2.3; p <0.05, and primiparity (OR = 7.7; p <0.05). risks related to maternal prognosis, they were Eclampsia, retroplacental hematoma, acute lung edema and Hellp Syndrome with exposure risks mentioned in the Table 3.

Regarding risk factors related to maternal prognosis, the low Apgar score had an influence on the fetal prognosis. The analysis showed a statistically significant distribution between the two parameters. Newborns scoring less than 7 had a 5.8-fold risk of dying (Table 4).

$$OR = 5.8 [95\% CI] = (3.1-7.8), P <0.05$$

In addition, premature newborns had a 3.6-fold risk of dying according to our analysis (Table 4) OR = 3.6 [95% CI] = (2.5-5.9), P <0.05.

Discussion

Prevalence

The prevalence of severe preeclampsia is variously estimated by the authors. It varies according to the population studied, the definition used, the level of development of the given country and the method used. This explains the disparity in the figures reported. The overall prevalence of PES which is estimated at between 3 and 5% of pregnancies in the world, with an incidence which would be much higher in developing countries [7]. In the United States, the prevalence is between 0.7 and 1.5% according to the authors [8]. In France, the incidence of PES was 1.0% (1.5% in nulliparas and 0.7% in multiparas) [5]. In Africa, this prevalence is poorly assessed; only hospital statistics are available with rates varying from 2.8 to 6.1% of deliveries [9]. Compared to studies carried out in Senegal, our rate of 3.12% of deliveries is lower compared to those found by Saar [10], Mbodji [11], Sène [12], Danmadji [13] and El Hasnaoui [6]. Tchente in Cameroon on the other hand had a rate of 2.3% lower than that found in our series [14]. Higher rates are found by Tchaou in Benin [15] and Lokossou in Cotonou [16] with respectively 14, 7% and 4.2%.

Sociodemographic characteristics

The predominance of young age in our series is consistent with data in the literature which consider them to be risk factors for the disease. This predominance of young age is found in the studies of Saar [10], Sène [12], Danmadji [13] and El Hasnaoui [6] in Senegal. In Tchente [14], on the other hand, the majority of patients were older between -Beye in Dakar [18] and Liu in Taiwan [9] were respectively 26 and 30 years old on average. We had recorded 52.37% of first-time mothers. In Tchaou's series [15], on the other hand, nulliparas (40.8%) were the most represented. Primigest were the most affected (50.56%) in our series. These results are lower than those found at the Dakar University Hospital (68%) [19] but almost overlap with those observed in the USA in 2010 (47.3%) [20].

The majority of patients in our series (63.86%) were housewives. For Attolou [21], low-income women are subjected to stress and significant physical exertion favoring the development of the disease. These results are corroborated by the work of Beauflis [22] who points

Table 3: Link between maternal complications and maternal mortality.

Complications Kindergarten	Death				Total	P value	OR [95% CI]
	Yes		No				
	N	%	N	%			
Eclampsia	11	7.53	135	92.46	146	0.000	8.5 [3.9-18.4]
Retroplacental hematoma	3	18.7	13	81.25	16	0.000	6 [3.8-16.5]
Hellp syndrome	3	18.7	13	81.25	16	0.000	6 [3.8-16.1]
Acute long edema	1	8.83	11	91.66	12	0.000	2.8 [5.2-30.0]

Table 4: Link between fetal complications and perinatal mortality.

Complications Fetal	Death				Total	P value	Ods [95% CI]
	Yes		No				
	N	%	N	%			
Apgar <7	37	18.87	159	81.12	196		5.8 [3.1-7.8]
Prematurity	32	17.29	153	82.70	185		3.6 [2.5-5.9]

out that the risk of having pregnancy-induced hypertension is higher in women who have significant physical or intellectual activity and / or poor social security.

Clinical and paraclinical aspects

The late-onset forms (36-39 WA) were the most frequent (65.3%) in our series. The same observation is made in the studies of Séné [12], Danmadji [13] and El Hasnaoui [6] in Senegal. In Séné [12], preeclampsia was diagnosed in 96% of cases after 29 WA. This late discovery is favored by the insufficiency or absence of correct prenatal follow-up of our patients. The mean number of ANC was 3.28 ± 1.05 in our series. In Tchaou's study, the pregnancy was not monitored (no prenatal consultation) or was poorly monitored (less than 4 antenatal consultations) in more than half of the patients (52.4%) [15]. The WHO currently recommends at least 8 contacts for monitoring a normal pregnancy [14]. Even though regular monitoring of the pregnancy does not prevent the onset of preeclampsia, it does allow it to be detected early and prevent progression to severe forms of the disease. The insufficient prenatal follow-up of patients explains the late evacuations at the stage of severe preeclampsia. The arterial hypertension was indeed severe in more than 93.90% of the patients in our series. The majority of our patients (95.48%) had albuminuria ≥ 2 crosses. The same observation is made by Hasnaoui [6] in whom 97% of patients had albuminuria ≥ 2 crosses. Tchaou [15] also reported in his study that 97% of parturients had albuminuria ≥ 2 crosses. The 24-hour proteinuria, which gives a more precise value, was rarely performed in our series due to lack of financial means in the patients. The edematous syndrome was inconsistent and found in 90.29% of the patients in our series; while Tchaou [15] and Mayi-Tsonga [25] had lower rates of 71.8% and 50% respectively. Sixty-six point thirteen percent (66.13%) of our patients had hyperuricemia. This rate is higher than that of Tchaou [15] and Mayi-Tsonga [25] who found 36% and 31% respectively in their series. According to Beauflis, the value of 58.8 mg / l of uricemia represents the threshold beyond which the risk of fetal death increases almost linearly, approaching 100% from 100.8mg/l [22].

Therapeutic aspects

In our series, parenteral Nicardipine was the first-line antihypertensive drug in almost all of our patients (99.32%). Alpha methyl dopa was used in combination with Nicardipine in 31% of patients with oral relay. Diuretics were rarely used (0.90% of patients) in acute lung edema or acute renal failure. This therapeutic attitude is the same in most of the studies carried out in Senegal [8,11-13]. Likewise, in the study by Tchente [14], Nicardipine was the most prescribed antihypertensive drug (69.6%) followed by alpha methyl dopa (12.9%), and clonidine (11.04%), Nifedipine (2.07%). These results differ from those of Neji [24] who had used dihydralazine in more than half of their patients. Likewise, Brouh [17] reported Dihydralazine (50.1%) as the first-line antihypertensive agent followed by Nicardipine (25.3%), Clonidine (8.0%), Nifedipine (6.4%), and Methyl dopa (4.2%). In our study, 77.5% of the patients had also benefited from an anti-convulsant treatment, mainly based on magnesium sulfate (97.29%). Magnesium sulfate is found to be superior in preventing and treating eclampsia attack, compared to other anticonvulsants. Its vasodilator effect is also interesting in order to lower blood pressure levels, but not without a risk of hypotension due to its potentiating action of nicardine [22]. The

combination of antihypertensive treatment with magnesium sulfate was almost systematic in our series and did not cause any noticeable side effects under good monitoring. In contrast, benzodiazepines and barbiturates were the only anticonvulsants used in other studies [26].

Regarding obstetrical treatment, the delivery route depends on the term of pregnancy and the maternal-fetal condition. We had comparable rates of vaginal delivery and Caesarean section with 48.53% versus 49.88%. Brouh [17] and Tchente [14] had obtained higher rates of caesarean section with respectively 58.5% and 57.5% of deliveries by caesarean section and this at a term of more than 37 weeks. On the other hand, Tchaou [15] and Lankouande [27] favored the vaginal route with respectively 51.5% and 54.3% of vaginal delivery.

Evolutionary and prognostic data

The outcome was favorable in 95.93% of the patients in our series with, however, significant morbidity in relation to the frequency of complications such as retroplacental hematoma and acute renal failure. Our results are also better than those found by Brouh and Mayi-Tsonga [17,25] with respectively 76.7% and 79% favorable outcome.

In terms of maternal morbidity and mortality, the most frequent main maternal complication was eclampsia with a frequency of 24.78% of cases, followed by HELLP syndrome (3.61%), retroplacental hematoma (3.61%) and acute lung edema (1.12%). Tchente [14] reports as complications the HELLP syndrome (12.7%), acute renal failure (13.3%), infections (8.2%), retroplacental hematoma (3.8%), disseminated intravenous coagulation (3.1%), acute lung edema (3.8%), post-caesarean hemorrhage (1.9%). These same complications are found in most African series [11,14]. They result from a lack of screening, late diagnosis of the disease and above all from insufficient monitoring of these high-risk pregnancies. These complications are remarkable for their unpredictability and their higher risk of maternal-fetal mortality [13,17,28,29]. Patients with eclampsia were 8.5 times more likely to die ($p = 0.05$ OR = 8.5 [3.9-18.4]).

Our maternal death rate (4.06%) was lower than the rates recorded by Tchaou [15] (6.8%) and by Mayi-Tsonga in Brazzaville (21%) [25]. Tchente had obtained 4.4% maternal deaths [14]. Brouh in Côte d'Ivoire found maternal mortality 16% higher [17]. In developed countries, the prognosis is better thanks to the means of screening and treatment. In the United States, maternal mortality from severe preeclampsia and eclampsia is 0.06% according to Mackay [30].

Fetal development between day 1 and day 6 of life was 84.42% of children alive against 15.57% of deaths. In Tchaou, the evolution was favorable in the short term (first week of life) in 57% of newborns against 17.6% of early neonatal death [15]. Tchente reported 21.8% perinatal deaths [14]. In the literature, the risk factors for perinatal mortality are most often prematurity, fetal hypotrophy and the existence of maternal complications. Thus, the fetal complications most represented in our work were, in order of frequency, by hypotrophy (51.46%) and prematurity (41.08%). In Tchente, the most common fetal complications were, in order of frequency, prematurity: 44.3%, intrauterine growth retardation: 23.4%, fetal death in utero: 17.7% [14]. These results differ from those obtained by Mboudou with 13.4% prematurity as the most frequent fetal complication [29].

Conclusion

Severe preeclampsia is a frequent pregnancy pathology in our practice. In our context, due to the low coverage of the health needs of mother and child, its prognosis is still severe.

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