

Factors Associated with Perinatal Outcomes of Severe Preeclampsia in Mothers Admitted to a Regional Hospital in Senegal

Diallo FB, Bah MB, Thiam O, Balde EY, Balde AT, Camara A*, Balde MA, Sylla IS and Kallo AO

Cardiac Service, Ignace Deen CHU, Conakry, Guinea

*Corresponding Author: Camara A, Cardiac Service, Ignace Deen CHU, Conakry, Guinea.

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Abstract

Introduction: PE still remains a public health problem, due to its consequences on both the fetus and the mother. The main objective of this study was to assess the perinatal consequences of preeclampsia and to analyze the associated risk factors.

Materials and Methods: This was a prospective, descriptive and analytical study carried out in the maternity unit of the Ndioum regional hospital over a period of 17 months from November 11, 2012 to April 6, 2014.

Results: The epidemiological profile was that of a primigest (51.2%), young (mean age = 23.24 ± 5.93 years) discharged for severe preeclampsia with a DBP ≥ 100 mmhg (62.2%) and whose proteinuria is greater than 3 crosses (59.8%) at the BU. The vaginal route was the preferred method of delivery (69.5%). The main maternal complications were represented by eclampsia (46.3%); followed by HELLP syndrome (20.7%). Parenteral calcium channel blockers were the most prescribed drugs (95.1%) followed by magnesium sulfate (81.7%). Perinatal complications were dominated by IUGR (40.2%); followed by respiratory distress (32.9%) and prematurity (31.2%). Low birth weight and newborn resuscitation were correlated with a risk of neonatal death with a P value of 0.019 and 0.044, respectively.

Conclusion: The perinatal complications of preeclampsia are considerable. Therefore, prevention through quality prenatal follow-up must be instituted for early detection, in order to improve the neonatal prognosis in the short and medium term.

Keywords: Preeclampsia; Perinatal; Associated Factors; Senegal

Introduction

Pre-eclampsia is defined by high blood pressure during pregnancy associated with significant proteinuria (> 300 mg/day) [1].

It still remains a public health problem, due to its consequences on both the fetus and the mother [2]. Although it has become rare in developed countries, it is still present in sub-Saharan Africa where quality prenatal care is still lacking [3].

Its prevalence in the world is estimated at nearly 3% of pregnant women and nearly 15% of causes of pregnancy-related death [4], and the very first factor of perinatal death [5].

It is also responsible for a large part of induced prematurity, the data of which are not well known in France, but estimated at 15% in the USA. In Africa, it is responsible for 30% of maternal deaths and 20% of fetal and neonatal mortality. In Senegal, it is the 3rd cause of pregnancy-related maternal mortality after bleeding and infections [2].

In our context, the late diagnosis at the stage of obstetric complications, the inadequacy of the therapeutic indications and the insufficient means of resuscitation explain the particular gravity of preeclampsia, which is one of the main causes of maternal and perinatal mortality [6]. It is in this context that this study was carried out, in order to assess the perinatal consequences of preeclampsia and to analyze the associated risk factors.

Severe preeclampsia is defined by the presence of one of the following criteria:

- Severe hypertension (PAS \geq 160 mmHg and/or DBP \geq 110 mmHg) or not controlled.
- Proteinuria $>$ 3 g/24h.
- Creatinemia \geq 90 μ mol/L.
- Oliguria \leq 500 mL/24h or \leq 25 mL/h.
- Thrombocytopenia $<$ 100,000/mm³.
- Hepatic cytolysis with ASAT/ALAT $>$ 2N.
- Epigastric abdominal pain and/or pain in the right hypochondrium that is persistent or intense.
- Chest pain, dyspnea, acute edema of the lung.
- Neurological signs: severe headache that does not respond to treatment, persistent visual or auditory disturbances, sharp, diffuse and polykinetic osteotendinous reflexes. 2. Proteinuria: $>$ 3 g/24h 3. HELLP SYNDROME associates: Hemolysis (LDH $>$ 600 IU/L) + hepatic cytolysis (ASAT/ALAT $>$ 2N) + platelets $<$ 100,000/mm³.

Materials and Methods

This was a prospective, descriptive and analytical study carried out in the maternity ward of the Ndioum regional hospital. It is a level 2 public health facility on the Senegal health pyramid. The study covered a period of 17 months from November 11, 2012 to April 6, 2014. We included patients with or without convulsive seizures, and meeting the criteria defined by group II of the National High Blood Pressure Education classification. Program of United States [6] namely: the appearance of arterial hypertension after the twentieth week of amenorrhea and the presence of proteinuria assessed by the method of strips and/or a dosage in urine collected in 24 hours. As well as newborns, from pre-eclampsia or eclampsia mothers who were included. We excluded from the study patients referred to the ward for other gynecological and/or obstetric pathologies associated with pregnancy-induced hypertension without proteinuria. The following parameters were studied using Epi data version 3.1 and SPSS version 21 software:

In the mother: age, parity, gestity, gyneco-obstetric history, prenatal consultations (ANC), clinical examination at entry, additional examinations carried out, mode of delivery, medical treatment instituted.

In newborns

Gestational age, anthropometric data, APGAR score, perinatal complications.

The first part of our study aimed at the description of the epidemiological characteristics (prevalence, age, parity, pregnancy), clinical data (gyneco-obstetric ATCD, number of ANC, AT, mode of delivery), paraclinical data (proteinuria), the treatment instituted and the ma-

ternal and neonatal complications. The second step was to study the factors associated with perinatal mortality. The chi-square test was used for comparison and variables with a P value < 0.05 were considered to be of statistical significance.

Results

Frequency

Preeclampsia was more common in the 14 - 23 age group, i.e. 54.9%; with an average age of 23.4 ± 5.93 years and extremes of 14 and 40 years. The majority of these women were primigravidae, with a percentage of 51.2. Pauciparous and multiparas were represented in the same proportions, i.e., 18.3% each. Prenatal visits (ANC) were for most cases (68.3%) less than four, with a mean of 2.61 ± 1.30 . The preferred method of delivery was the vaginal route 69.5% (Table 1).

Variables	Workforce	(%)	
Age range**	14-23	45	54,9
	24-33	34	41,5
	34-43	3	3,7
Parity	Nullipare	36	43,9
	Primipare	16	19,5
	Fewer (2-3)	15	18,3
	Multipare (> 3)	15	18,3
Managed	Primigeste	42	51,2
	Multigeste	40	48,8
Pregnancy follow-up	CPN < 4	56	68,3
	CPN ≥ 4	26	31,7
Mode of delivery	Low way	57	69,5
	Cesarean	25	30,5
Gynecological ATCD	Stillborn	9	12,2

Table 1: Distribution of preeclampsia patients according to epidemiological data and gynaeco-obstetric history

**Average age = 23.24 ± 5.93 years Extreme = 14 and 40 years Mean ANC = 2.61 ± 1.3 .

Women were seen in 62.2% of cases with a DBP ≥ 100 mmhg. The urine dipstick was the test of choice for screening for proteinuria, particularly albuminuria, which was predominantly (59.8%) with three crosses. Maternal complications were dominated by eclampsia (46.3%), followed by HELLP syndrome (20.7%), with a single case of DIC (1.2%). Parenteral calcium channel blockers, in this case injectable Loxen, were the most prescribed drugs 95.1% followed by magnesium sulfate 81.7% (Table 2). Perinatal complications were dominated by in utero growth retardation (IUGR) with a number of 33 cases, i.e. 40.2%; followed by respiratory distress 32.9% and prematurity 31.2%. We had recorded 14 cases of death or 17.1%, including 5 cases of death in utero and 9 cases of neonatal death. Neonatal resuscitation was performed in 45.1% of newborns (Table 3). Low birth weight and newborn resuscitation were correlated with a risk of neonatal death with a P value of 0.019 and 0.044, respectively (Table 4).

Variables		Workforce	(%)
Arterial pressure	TAD ≥ 100 mmhg	51	62,2
	TAD < 100 mmhg	31	37,8
Albuminuria	1 croix	16	19,5
	2 croix	11	13,4
	3 croix	49	59,8
Complications	Eclampsia	38	46,3
	HRP	4	4,9
	HELP Syndrome	17	20,7
	OAP	4	4,9
	IRA	13	15,9
	CIVD	1	1,2
Treatment	MgSO ₄	67	81,7
	IC	78	95,1
	Anti-HTA centraux	47	57,3
	Valium	16	19,5
	Transfusion	5	6,1

Table 2: Distribution of preeclampsia patients according to clinical data, complications and treatment.

Variables		Work force	(%)
Score d'Apgar	< 7	28	34,1
	> 7	54	65,9
Birth weight	< 1500g	27	32,9
	1500 - 2500g	13	15,9
	> 2500g	40	48,8
Complications	Prematurity	26	31,2
	RCIU*	33	40,2
	Respiratory distress	27	32,9
	Asphyxia	10	12,2
	Death	14	17,1
Neonatal treatment	Intensive care	37	45,1

Table 3: Neonatal data.

Variables	Work force	[IC à 95%]	P. value
Weight		[0,00-0,33]	0,019
< 2500	40		
≥ 2500	42		
Prematurity	26	[0,80-3,38]	0,387
Growth retardation	33	[0,6 - 3,41]	0,355
Respiratory distress	27	[2,95-48,04]	0,44
Asphyxia	10	[0,64-0,95]	0,821
Yes	37	[0,40-4,008]	0,044

Table 4: Neonatal factors associated with neonatal mortality.

Discussion

Frequency

Maternal age is a risk factor for the onset of preeclampsia described in the literature. The 20 - 35 age group seems to be the most vulnerable and nulliparas are victims in 3 - 7% of cases [1,2], our results corroborate these data. This could be explained by the intervention of the immunological factor in the genesis of preeclampsia, in particular the short duration of exposure to the father's semen in the latter. The majority of patients followed for preeclampsia did not comply with antenatal consultations, and this lack of appropriate monitoring and screening would increase the risk of preeclampsia by 6 to 20 [8].

The preferred route of delivery in our study was the low route. This result could be explained by the fact that women are referred to our structure during the labor phase.

Almost all of our patients were seen with complications, which represented the main reason for referral. These complications, observed in our study and described in the literature, were dominated by eclampsia 46.3% and HELLP syndrome 20.7%. Eclampsia has become a rare complication in developed countries, thanks to early treatment before the appearance of one of the main signs of preeclampsia. On the other hand, the monitoring of pregnancies by qualified health personnel, the screening of high-risk pregnancies and patient information have helped to reduce this pathology [3]. However, it remains frequent in our developing countries, with an incidence of 1,000 per 100,000 births in Senegal. By comparison, in developed countries, eclampsia complicates an average of 1 to 5% of preeclampsia, or an incidence of 25 to 50 per 100,000 births. With regard to the HELLP syndrome, the data in the literature estimate its frequency between 4 and 12% of severe preeclampsia [6]. In an emergency setting, we used injectable calcium channel blockers for a rapid drop in blood pressure, associated with central antihypertensive drugs. Magnesium sulfate, which has been widely prescribed in our patients, has been for the prevention of eclampsia for the most part, but also for the onset of eclampsia. In this case, we combined it with Benzodiazepine, in this case valium.

For fetal and neonatal complications, it emerges that intrauterine growth retardation was the most frequent outcome with a proportion of 40.2% in our series against 63.3% in the study by Boiro., *et al.* [2], this growth retardation is an important complication of toxemia of pregnancy, given the placental alterations that the latter causes. Respiratory distress was present in 32.9% of children of preeclampsia mothers. Data from the literature show that Doppler velocimetric analysis of blood flow in the umbilical artery, often impaired in preeclampsia, is correlated with an increase in respiratory complications in newborns to preeclampsia mothers, compared to newborns from preeclampsia. mother without preeclampsia at the same gestational age [9]. Preeclampsia is a high risk situation for preterm delivery, whether spontaneous or medically decided for maternal and/or fetal rescue [10]. This prematurity was present in 31.2% of the newborns in our series.

We recorded a death rate of 17.1%. These deaths had a statistically significant association with low birth weight and fetal resuscitation, with a P value of 0.019 and 0.044, respectively. Our results agree with those of previous studies, which have shown that neonatal mortality is significantly associated with low birth weight and prematurity [2].

Conclusion

Preeclampsia is frequent in our regions, with its contingent of considerable perinatal complications, the outcome of which can be fatal in the absence of adequate and rapid management. Therefore, prevention through quality prenatal follow-up must be instituted for early detection, in order to improve the neonatal prognosis in the short and medium term.

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