fortune Journals

Research Article

JOURNAL OF PEDIATRICS, PERINATOLOGY AND CHILD HEALTH

ISSN: 2641-7405

Neonatal Complications of Severe Pre-Eclampsia and Eclampsia in Rural Area in Sénégal

Diouf Fn[1]*, Gueye M[2], Boko Osf[1], Thiam L[3], Faye Pm[4]

Abstract

Introduction: Pre-eclampsia and eclampsia are responsible for high maternal-fetal mortality. The aim of this study was to evaluate the prevalence, and to assess their early and late perinatal consequences.

Material and Methods: This was a retrospective study in the paediatric ward of the CHRZ over a 12-month period. We included records of hospitalized newborns of mothers with severe pre-eclampsia or eclampsia. Sociodemographic, epidemiological and maternal-fetal parameters were analysed.

Results: 125 newborns were included (11.7% of admissions). They were born to mothers with severe pre-eclampsia (78.4%) and eclampsia (21.6%). The average age of the mothers was 26.5 years, with 31.7% between 20 and 25 years. They came from a rural area (49.6%), were not professionally active (67%) and were not educated (33.3%). The average gestation and parity was 2.7 with 45.6% primigravida and 47.2% primipara. Monitoring was done by a midwife (83.2%) and 69.6% had undergone less than 4 antenal consultations. Delivery was by caesarean section (54.8%), the newborn was premature (49.6%), and antenatal corticosteroid therapy was administered in 17.6% of cases. Acute fetal distress was noted in 48.8% of whom 11.2% had not cried. The average weight was 2318 g. The neonatal complications were prematurity (49.6%), IUGR (28%) and perinatal asphyxia (25.6%). We noted 12% of deaths before the 7th day^{ème} of which 80% were premature. Four other deaths were noted between 3ème and 9ème months.

Conclusion: The neonatal repercussions are not negligible in our context, hence the need for better collaboration between the practitioners of the mother-child couple.

Keywords: Eclampsia; Complications; Newborn; Rural area; Senegal

Introduction

There are many conditions that put the pregnant woman and the fetus at risk of disease during pregnancy, childbirth and the postpartum period. One such condition is gestational toxaemia, also known as Pre-Eclampsia (PE). This is a serious condition occurring during pregnancy characterized by elevated blood pressure and proteinuria. The disease can be complicated by eclampsia, which is responsible for 8% of maternal deaths [1]. These two conditions are responsible for 10-25% of maternal deaths and 33.3% of perinatal and neonatal mortality in developing countries [2].

The aim of this study was to assess the prevalence and consequences of severe EP and eclampsia in the early and late neonatal period and to describe the profile of parturients with these conditions.

Patients and Methods

This was a retrospective, descriptive, single-centre study carried out in the maternity ward and neonatology department of the Ziguinchor regional hospital (ZRH) over a period from 1 January to 31 December 2018 (12 months). The regional hospital is a level 2 facility according to the health pyramid and is located in the city of Ziguinchor, about 500 km south of Dakar, the capital of Senegal. We included in the study all newborns hospitalized in the department from

Affiliation:

[1]*Pediatrics CHRZ, Senegal*

[2]*Pediatrics Abass Ndao Hospital, Senegal*

[3]*Pediatrics Peace Hospital, Senegal Hospital, Senegal*

[4]*Pediatrics Albert Royer Children's Hospital, Senegal*

***Corresponding author:**
François Niokhor Diouf, Paediatrician, Regional Hospital Ziguinchor/ Senegal BP 705 HLM Néma, Senegal

Citation: Diouf Fn, Gueye M, Boko Osf, Thiam L, Faye Pm. Neonatal Complications of Severe Pre-Eclampsia and Eclampsia in Rural Area in Sénégal. Journal of Pediatrics, Perinatology and Child Health 6 (2022): 320-323.

Received: June 12, 2022
Accepted: June 24, 2022
Published: July 11, 2022

Diouf FN et al., J Pediatr Perinatol Child Health 2022
DOI:10.26502/jppch.74050112

mothers who had presented with severe PE or eclampsia. The data were collected on an individual survey form filled in from the hospital records and telephone calls. On each form, the following parameters were mentioned: socio-demographic and epidemiological characteristics of the mother, follow-up of the pregnancy and delivery, characteristics of the newborn at birth, complications during hospitalisation and the remote evolution of the newborn. Data analysis was done on Epi Info7 version 3.5.4. The results were expressed as absolute, mean and percentage values. The comparison of proportions was performed using the PEARSON CHI2 test.

Results

During the period of this study, 1737 parturients were admitted to the maternity ward of the ZRH, of whom 220 had EP or eclampsia (12.7%). These 220 mothers gave birth to 20 stillbirths or 9.1%. One hundred and twenty five (125) newborns were included in this study (11.7% of admissions). They were born to severe pre-eclampsia mothers in 98 cases (78.4%) and to eclampsia mothers in 27 cases (21.6%).

Epidemiological and socio-demographic characteristics

The average age of the mothers was 26.5 years [extremes 15 and 47 years], 31.7% were between 20 and 25 years old. Half of the women (49.6%) came from rural areas, 33.3% were uneducated and only 4.8% had higher education. More than half (67%) had no professional activity. The average gestation and parity was 2.7 [extremes 1 and 11] with 45.6% primigravida and 47.2% primipara.

Monitoring of pregnancy and childbirth

The pregnancy was most often monitored (83.2%) by a midwife. More than half of the parturients (69.6%) had undergone less than 4 antenatal consultations (ANC). A pathology during pregnancy was present in 26 cases, dominated by anaemia (19.2%). The pregnancy was mostly monofetal (89.6%). The mean gestational age was 35.8 weeks of amenorrhea (WA) [extremes 24 and 42 SA]. Almost half of the mothers (49.6%) had experienced a preterm delivery. Antepartum corticosteroid therapy was administered in 17.6% of the mothers. Systolic blood pressure (SBP) was greater than or equal to 160 mm hg in 68.8% of the mothers [extremes of 120 and 230 mm hg]. Diastolic blood pressure (DBP) was greater than or equal to 110 mm hg in 48% of cases [extremes of 60 and 140 mm hg].

Characteristics of newborns at birth

The weight of the newborns varied between 600 and 4265g with an average of 2318g. More than half (59.2%) weighed less than 2500g. The average height was 46.8cm [extremes 35 and 55 cm]. The mean head circumference was 32.3cm [range 23-45cm]. Intrauterine growth retardation (IUGR) was noted in 28% of cases, and was disharmonious in 82.3%. The main reasons for transfer were prematurity (49.6%), infectious risk (40%), IUGR (28%) and perinatal asphyxia (25.6%). Data on route of delivery, presentation, amniotic fluid appearance, birth cry and Apgar are shown in Table 1.

Changes during hospitalization

The average length of stay for newborns was 6.1 days [extremes of 1 and 27 days]. The mortality rate was 12% (15 deaths), the majority of which were due to prematurity (80%). Complications occurred during hospitalization, the distribution of which is noted in Table 2.

Table 1: Distribution by route of delivery, presentation, amniotic fluid appearance, birth cry and Apgar.

		Workforce	Percentage (%)
Mode of Delivery	Normal Delivery	56	44,8
	Instrumental Delivery	1	0,8
	Caesarean Section	68	54,4
Presentation	Cephalic	115	92
	Headquarters	10	8
Appearance of the Amniotic Fluid	Clair	71	56,8
	Tinted	45	36
	Meconial	3	2,4
	Pea Purée	2	1,6
	Bloody	4	3,2
Gender	Male	66	52,8
	Female	59	47,2
Apgar at 5minute	0-3	1	0,8
	6-Apr	31	24,8
	10-Jul	93	74,4

Diouf FN et al., J Pediatr Perinatol Child Health 2022
DOI:10.26502/jppch.74050112

Evolution after exit

We were able to find out the fate of 71 children. Four (4) had died. The cause and period of death are noted in Table 3.

Discussion

Newborns of EP or eclampsia mothers accounted for 11.7% of neonatal hospitalizations in our study. In Dakar, Ndiaye et al [3] in 2012 found a lower incidence of 8.3%. These non-negligible incidences confirm the frequency of fetal and neonatal complications of EP and eclampsia, especially in referral maternity hospitals such as ours. In Europe, this incidence is lower and varies between 2.7 and 10 per 10,000 deliveries [4], probably due to the availability and quality of the nursing staff, but also to the more efficient technical facilities. The average age of the mothers was 26.5 years, comparable to that found in other series in Dakar and Cotonou [5, 6]. A much lower average age (17.1) was noted in Mali [7]. It has been reported that younger women are more at risk of eclampsia and severe PE [3]. Almost half of the mothers in our series were from rural areas (49.6%). Rural areas are generally associated with a low socio-economic level which would have doubled the risk of pre-eclampsia and eclampsia [8]. Indeed, it is not uncommon in our context to be confronted with non-compliance of parturients due to the financial difficulties they face. However, other authors have found that disadvantaged groups are not necessarily at greater risk [9, 10]. We noted in this work that housewives with no income-generating activity (67%) and no or low level of education (95.2%) were more represented. This same observation has been made by several authors [7, 11]. This vulnerability would be linked to the physical and psychological overwork to which they are exposed. Primigravida is considered a risk factor for EP [8, 12]. Almost half of the mothers in our series were in their first pregnancy (45.6%) and their first child (47.2%). This same observation has been reported by other authors [3, 13].

On the other hand, in the Nigerian and Malian series, multiparous (58.6%) and nulliparous (54.6%) mothers predominated respectively [7, 14]. The incidence of EP appears to be five times higher in twin pregnancies than in singleton pregnancies. In this study 10.4% of mothers had a twin pregnancy, a significant percentage given the rarity of multiple pregnancies. The WHO recommends 4 ANCs for the follow-up of pregnancies. More than half of our mothers (69.6%) had not reached 4 ANC. This rate is close to that found by Samaké et al. with 64.6% [7]. Regular monitoring of the pregnancy does not prevent the occurrence of pre-eclampsia, but it does promote early detection and better prevention of complications [12]. Quality ANC helps to minimise the occurrence of complications during pregnancy. In our work, parturients were most often followed by a midwife (83.2%). We noted anaemia in 19.2% of our mothers. To date, an implication of anaemia in the genesis of EP has not been demonstrated. A relatively low rate of antenatal corticosteroid therapy (17.6%) was noted in our series compared to the high number of preterm deliveries. These results could be related to a poor filling in of the referral forms, but also to the severity of the clinical picture not allowing time for antenatal corticosteroid therapy. In addition, lack of product or omission could be the cause of this low rate. This work shows systolic hypertension in 98.4% with 68.8% of severe cases and diastolic hypertension in 96% with 48% of severe cases. Sogoba found 66.7% of severe systolic hypertension [11]. The same author found 53.3% of severe diastolic hypertension respectively. Ben Salem et al [15] found that a SBP above 160mmhg and DBP above 110mmhg were associated with an increased risk of eclampsia. Nearly half (49.6%) of the parturients had delivered prematurely before 37 days' gestation. A Congolese study concluded that the risk of prematurity was multiplied by 4 if the parturients were hypertensive [16]. Sogoba found 37.8% prematurity. In the USA

Table 2: Distribution of complications occurring during hospitalization.

Complications	Workforce	Percentage (%)
Hypoglycemia	17	13,6
Hypothermia	6	4,8
Ulceronecrotizing enterocolitis	6	4,8
Hyperglycemia	5	4
Sepsis	4	3,2
Anemia	3	2,4
Convulsions	3	2,4
Bleeding	3	2,4
Hyper bilirubinemia	2	1,6

Table 3: Distribution of causes of death.

Causes of death	Workforce	Age of death
Respiratory Distress	1	3e months
Febrile Condition	2	4e and 5e months
Severe Malnutrition	1	9 months

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DOI:10.26502/jppch.74050112

it is estimated that 15% of births are preterm due to EP [9]. The choice of delivery route depends on the obstetric conditions and the fetomaternal prognosis. Severe EP and eclampsia represent an obstetric emergency. In our series, more than half of the mothers (54.8%) had delivered by caesarean section. The same trend was noted in Congo with 57% [17]. Acute Fetal Distress (AFD) in the first minute was noted in our series in 48.8%, including 11.2% of asphyxia. Sogoba in his study found much lower rates of AFS with 19.5% [11].

In our contexts, a lack of optimal monitoring of the fetal condition during EP could be associated with this high rate of neonatal suffering. Indeed, the emphasis is much more on maternal monitoring to the detriment of fetal monitoring. The average weight of our newborns was 2318g. These results confirm the hypothesis that EP is a cause of low birth weight. In this study, the main reasons for transferring newborns were prematurity (49.6%), Intrauterine Growth Retardation (IUGR) (28%), and perinatal asphyxia (25.6%). These same reasons have been found in the literature but with a variable order of frequency [3, 11], making these three conditions the most frequent perinatal complications of pre-eclampsia. During hospitalisation, hypoglycaemia was the most common complication (13.6%), probably related to placental ischaemia. The mortality rate was 12%, 80% of which were premature and most often associated with IUGR in 33.4% of cases and asphyxia in 11.2% of cases. These deaths occurred early before the 7th day of life. These morbid factors associated with neonatal deaths in our series are in line with the study by Cheng et al [18] who showed that the effects of EP on neonatal mortality rate were a function of gestational age and birth weight.

Conclusion

Severe PE and eclampsia are exclusively gravidic pathologies that cause serious maternal, fetal and neonatal complications. The fetal and neonatal complications identified in this study are similar to those reported in the literature, but their prevalence varies from one study to another. The repercussions in the neonatal period and the death rate remain high in our context. The risk factors elucidated in this study are multiple, hence the need for better collaboration between practitioners of the mother-child couple and decision makers.

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Citation: Diouf Fn, Gueye M, Boko Osf, Thiam L, Faye Pm. Neonatal Complications of Severe Pre-Eclampsia and Eclampsia in Rural Area in Sénégal. Journal of Pediatrics, Perinatology and Child Health 6 (2022): 320-323.