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Epidemiological and Clinical Profile of Severe Pre-eclampsia at University Clinics of Kinshasa

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ABSTRACT

Background and aims: Severe pre-eclampsia (SEP) is an obstetric emergency requiring the hospitalization of patients in structures allowing maternal and fetal care. The incidence between 8.5% and 13% and the epidemic-like complications of PES in sub-Saharan Africa that are not or poorly monitored are well known in mother-child couples. The aims were to assess the effectiveness of the therapeutic protocol (scientific management) in reducing the incidence and complications of PES at CUK. The secondary objective of this study was to determine the secular trend from 2006 to 2015 and the projection from 2006 to 2030 of the incidence of SEP.
Methods: This retrospective evaluative analysis was carried out over 10 years (2006-2015) and in the Department of Gynecology and Obstetrics of CUK. The inclusion criteria for exhaustive sampling were to consider all medical records of pregnant women during the period and setting of the present study.
Results: After following the antenatal therapeutic protocol of 8772 pregnant women, the frequency of PE was 10%, including 612 for 69.8% with moderate pre-eclampsia against 265 for 30.2 with PES). Among the cases of PES, the frequency of maternal complications including cesarean section, pregnancy age at childbirth ≥ 35 weeks of amenorrhea, hypertensive retinopathy, HELLP syndrome and retroplacental hematoma were respectively 69.4%. , 69.1%, 17.7%, 0% (n = 0%) and 7.5%. The frequency of fetal neonatal complications including impaired APGAR at the fifth minute, low birth weight, perpartal asphyxia, prematurity, intrauterine growth retardation, fetal distress, intrauterine death and neonatal death were 33.6%, 69.1%, 40.4%, 40%, 32.5%, 26%, 20.8% and 12.5% respectively.
Conclusion: The therapeutic regimen for the management of PES is not codified in the University clinics of Kinshasa.

Keywords: SEP, care, evaluation, University Clinics of Kinshasa

INTRODUCTION

Pre-eclampsia (PE) is a common condition in pregnant women. (1). It is a specific disorder of pregnancy characterized by high blood pressure, with significant proteinuria occurring from the 20th week of amenorrhea (2). It is multifactorial and is an integral part of the continuum of hypertensive disorders of pregnancy (3). The precise incidence of PE is difficult to obtain and varies by country. It occurs in 2-10% of pregnancies worldwide (4-8). In the

United States and Canada, its reported prevalence ranges from 5 to 7% of pregnancies (9), while in Europe, particularly France, PE complicates 2 to 3% of pregnancies. The prevalence of PE in Asia ranges from 0.3 to 1.2% (10-13). Although it has become rare in developed countries, PE is still common in sub-Saharan Africa where the quality of prenatal care remains suboptimal. According to the World Health Organization (WHO), its incidence is seven times higher in low-resource countries than in developed countries (11). In Africa, the prevalence of PE is estimated at nearly 10%, a prevalence significantly higher than the global average (6.14-19). Despite the high prevalence of this pathology, its etiology is still not well understood (20). Once called the theories disease, today it is accepted as an endothelial disease (21).

PE is classified into 3 groups according to the severity of the clinical signs namely, mild, moderate and severe PE. Severe preeclampsia (SEP) is defined as severe hypertension with systolic blood pressure (SBP) ≥ 160 mmHg and / or diastolic blood pressure (DBP) ≥ 110 mmHg associated with at least one of these signs: renal impairment, impairment pulmonary, hepatic damage, ocular damage, neurological disorders (22). It is a worrying pathology and constitutes a real major public health problem in the world and, particularly, in countries with low resources (23). It is associated with significant fetal-maternal morbidity and mortality, high health costs and a lack of consensus in its management (24). Faced with this negative impact on fetal-maternal health, the WHO and the learned societies of Gynecology and Obstetrics had formulated recommendations with a control strategy on prevention, detection of the pathology and early treatment (25). Regarding management, there is controversy over drugs used outside of childbirth (26). The WHO recommends the use of anti-calciums, central antihypertensive drugs, peripheral vasodilators, β-blockers and anticonvulsants (27). In the United States, the pharmacological classes used are central antihypertensive drugs, peripheral vasodilators and anticalcics (9); in France (28) these are anti-calciums, β-blockers and central antihypertensive drugs. In sub-Saharan Africa, central antihypertensive drugs, anti-calciums and anticonvulsants are the most widely used (29, 30). In the Democratic Republic of Congo (DRC), in general, and at the University Clinics of Kinshasa (CUK) in particular, if the epidemiological and clinical aspects of PE have been studied (17-19, 31), the management of PE, in general, and PES, in particular, have not yet, to our knowledge, been studied. Hence the interest of this study.

General objective of this study was to describe the epidemiological and clinical profile of severe pre-eclampsia at University Clinics in Kinshasa.

MATERIAL AND METHODS

This is a cross-sectional and descriptive study which took place at the Department of Gynecology and Obstetrics of the University Clinics of Kinshasa on the records of childbirth followed for severe preeclampsia during the period from January 2006 to December 2015, i.e. 10 years.

Our sample was exhaustive, consisting of medical records of childbirth followed for PES during our study period. Included in the present study were all the records of deliveries with PES containing the variables of interest. All the non-exploitable files as well as those containing less than 50% of the variables studied, the cases of HTAG, mild PE, moderate PE, the cases of PES followed in intensive care were not included in the study.

A documentary review was carried out in the archives services of the University Clinics of Kinshasa. In this regard, provided with a previously established data collection sheet, we had collected specific information from the medical records of the newborns related to the variables in this study. The

following variables were studied: socio-demographic variables: age, profession, level of education; gynecological and obstetrical history: parity, gestity, PE, cesarean section. Clinical and biological variables (Maternal: height, weight, headache, vertigo, epigastralgia bar, BP, proteinuria, hypertension impact assessment and complications; Fetal: APGAR, birth weight), Variables related to Childbirth: gestational age at childbirth and mode of delivery. Pharmacological classes used

Operational definitions

PES was defined as SBP ≥ 160 mmHg and / or DBP ≥ 110 mmHg with massive proteinuria from the 20th WA. Parity was defined as the number of previous pregnancies that reached at least 28 weeks and regardless of the outcome. Depending on the number of these pregnancies, the nulliparous was the woman who had not yet had one, the primipara was the one who had had one, the paucipara between 2 and 3, the multiparous between 4 and 5 and the great multipara au- beyond 5. Pregnancy was defined as the number of intrauterine and ectopic pregnancies the woman had. According to the number of these pregnancies, the primigeste was the one who had had one, the paucigeste between 2 and 3, the multigeste between 4 and 5, great multigeste beyond 5. Fetal heart sounds were good if the value was between 120 and 160 beats per minute; disturbed if the value was <120 bpm or> 160 bpm; absent if the value was zero. Retinopathy was defined according to the classification of Wagener and Keith ALAT: was considered normal if the value was between 0 and 40 US and abnormal if the value was> 40 US. ASAT: was considered normal if the value was between 0 and 45 US and abnormal if the value was> 45 US. Urea: was considered normal if the value was between 10 and 42 mg / dl and abnormal if the value was> 42 mg / dl. Creatinine: Was considered normal if the value was between 0.5 and 2 mg / dl and abnormal if the value was> 2 mg / dl. Uric acid: was considered normal if the value was between 2.6 and 7.5 mg / dl and abnormal if the value was> 7.5 mg / dl. The target PA was defined as the reduction of the PA in the values between 140 and 150 mmHg for the PAS and / or 90 and 99 mmHg for the PAD. APGAR has been defined as a set of clinical elements that assess the condition of the newborn at birth. It is calculated on 5 elements which sides each from 0 to 2. It is evaluated at the 1st, 5th and 10th minute of birth. At the 1st minute, APGAR is good if the score is ≥ 7, bad if <7. Normal weight was values 18.5-24.9 Kg / m², overweight 25-29.9 Kg / m² and obesity ≥ 30 kg / m2. The normal birth weight, when the child is born at term with a weight of 2250-3999 gr. An FPN, when born with a weight <2500 gr.

Perinatal asphyxia: when a child is born with APAR <7, respiratory distress, neurological disorder.

Statistical analysis

The data were entered using Microsoft Office Excel® 2013 software. After quality control and consistency checking, the data were exported to SPSS 21.0 software for analyzes. Continuous variables were presented as means ± standard deviation and discrete variables as absolute and relative frequencies. The comparison of means was made by analysis of variance (ANOVA). The p-value <0.05 was considered to be the threshold of statistical significance.

Ethical considerations

During this study, after approval from the authorities, confidentiality was guaranteed. The data has been collected, processed and published confidentially and anonymously. The research team was bound by professional secrecy in all matters relating to the information gathered during this study.

RESULTS

During the period from January 2006 to December 2015, we recorded 565 cases of PE including 265 cases of PES at the University Clinics of Kinshasa which had fulfilled the inclusion criteria for our study.

Frequency of severe preeclampsia

Out of 8772 deliveries recorded during the study period, PE represented 565 cases, or a frequency of 6.44%. From this frequency, the SEP came back to 46.9%. Relative to the total number of deliveries, the frequency of PES was 3.02%.

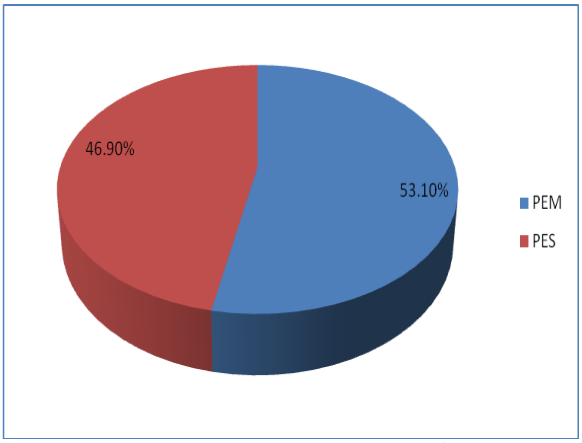

Figure 1. Frequency versus severity of PE

Figure 2 shows the evolution of SEP over all PE cases during the study period.

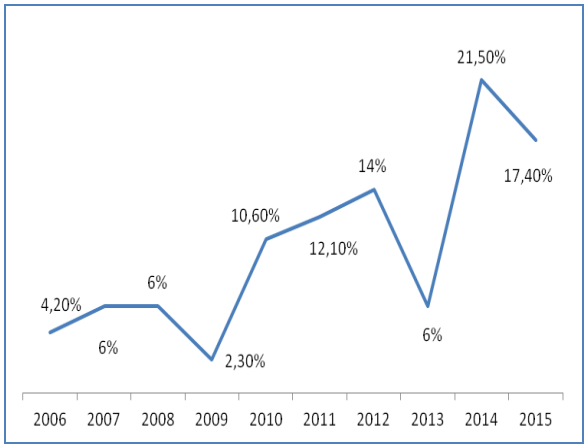

Figure 2. Frequency of PES during the study period by year

This figure shows that the highest frequency was observed in 2014 and the lowest in 2009.

Socio-demographic characteristics of the women born in the study.

The socio-demographic characteristics of pregnant women with PES are summarized in Table 1.

It appears from Table I that the age group of 20 to 34 years was the most concerned. Children under 20 were the least represented. The average age was 31.8 ± 5.8 years. Most of the births had secondary or higher education and the majority of our births were unemployed.

Table 1. Socio-demographic characteristics of childbirth followed for SEP

Variable	Effectif (n=265)	%	Mean ± SD
Age (year)			
≤ 19	4	1.5	
20 – 34	167	63	31.8 ± 5.8
≥ 35	94	35.5	
Level of study			
Illiterate	1	0.4	
Primary	53	20	
Secondary	96	36.2	
university	97	36.6	
Unspecified	18	6.8	
Profession			
Official	53	20	
Informal	9	3.4	
No occupation	203	76.6	

Clinical characteristics of the women born in the study

Table 2. Distribution of newborns and fetuses according to their clinical characteristics

Variable	Effectif (n=265)	%	Mean± SD
Gesture			
Primigest	81	30.6	
Paucigest	81	30.6	
Multigest	67	25.2	
Large multigest	36	13.6	
Parity			
Nulliparous	1	0.4	
Primiparous	106	40	
Pauciparous	86	32.5	
Multiparous	51	19.2	
Large multipare	21	7.9	
Reason for consultation			
Headache	84	31.7	
Dizziness	58	21.9	
Epigastric	37	14.0	
Blurred vision	54	20.4	
Weight (Kg)			
< 90	213	80.4	78.5 ± 13.9
≥ 90	52	19.6	
BMI (Kg/m2)			
Normal	43	16.2	
Overweight	118	44.5	28.8 ± 3.9
Obesity	104	39.2	
SBP	265		174.3 ± 19.1
DBP	265		114.9 ± 10.5
Age pregnancy admission (WA)			
28 - 27	7	2.6	
28 – 34	96	36.2	34.9 ± 3.7
> 34	162	61.1	
History of obstetrical			
PE	64	24.2	
Caesaraen	38	14.3	
Fetal heart sound			
Well	182	68.7	
Disturbed	42	15.8	
Absent	41	15.5	

From this table, the average pregnancy rate in our newborns was 3.1 ± 2.2; the primigeste and the paucigeste were the most represented; the parity mean among our newborns was 2.6 ± 1.8; the primipara was more represented than the others.

Headaches were the major complaints. Regarding weight, 80.4% had a weight <90 kg and 44.5% of the women born were overweight; the mean BP was 174.3 ± 19.1 for SBP and 114.9 ± 10.5 for DBP; in 61.1% of cases the gestational age was above 34 weeks; 24.2% of the deliveries had a history of preeclampsia and in 69% of the cases the BCF was not disturbed.

Additional examinations of the women born in the study

The additional examinations carried out for the 265 who gave birth are shown in Table III.

This table shows that the renal assessment was carried out in 51% of the women born, followed by the liver assessment, fundus and cardiac assessment.

Table 3. Distribution of paraclinical examinations among our newborns

Paraclinical examinations	Effectif (n=265)	%
Fundus	101	38.1
Normal	54	53.5
Stage I hypertensive retinopathy	8	7.9
Stage II hypertensive retinopathy	17	16.8
Stage III hypertensive retinopathy	22	21.8
Electrocardiogram	57	21.5
Normal	33	57.9
Sinus tachycardia	21	36.8
Ventricular hypertrophy	3	5.3
ALAT	121	100
Normal	105	86.8
Unnatural	16	13.2
ASAT	121	100
Normal	108	89.3
Unnatural	13	10.7
Urea	135	100
Normal	126	93.3
Unnatural	9	6.7
Creatinine	135	100
Normal	128	94.8
Unnatural	7	5.2
Uric acid	135	100
Normal	61	45.2
Unnatural	74	54.8

Management of PES in the study population

Treatment regimens used

Five treatment regimens were used for the treatment of PES and Table V gives the different combinations.

Table 4. Presentation of treatment regimens used in childbirth

Therapeutic regimen	**Effectif**	**%**
α-méthyl dopa + Nifédipine + $MgSO_4$	138	52.1
α-méthyl dopa + Nifédipine + Diazépam + $MgSO_4$	68	25.7
α-méthyl dopa + Nifédipine + Clonidine + $MgSO_4$	37	14.0
α-méthyl dopa + Nifédipine + Nicardipine + $MgSO_4$ + Diazépam	14	5.3
α-méthyl dopa + Nicardipine + Clonidine + Diazépam + $MgSO_4$	8	3.0
Total	**265**	**100**

From this table, the most used scheme was the combination of three drugs: α-methyl dopa, Nifedipine, MgSO4, followed by α-methyl dopa, Nifedipine, Diazepam, MgSO4. The other schemes were used little.

Characteristics of childbirth

The characteristics of childbirth are presented in Table 5

From this table it can be seen that the mean gestational age at delivery was 35.1 ± 3.4 WA and delivery in the majority of cases occurred at an age of ≥ 35 WA; Caesarean section was performed in 69.4% of the births. From this table, the APGAR at the first minute averaged 6 ± 3, at the fifth minute 6 ± 4, and at the tenth minute 7 ± 3; 69.1% of newborns had a low birth weight (LBW).

Table 5. Gestational age at childbirth and route of delivery

Variables	Effectif (n=265)	%	Mean ± SD
Gestational age at childbirth **(WA)**			
< 28	5	1.9	
28 – 34	77	29.1	35.1 ± 3.4
≥ 35	183	69	
Delivery route			
Low	81	30.6	
Caesarean	184	69.4	
APGAR 1’			
Well	158	59.6	6 ± 3
Bad	107	40.4	
APGAR 5’			
Well	176	66.4	6 ± 4
Bad	89	33.6	
APGAR 10’			
Well	198	74.7	7 ± 3
Bad	67	25.3	
Birth weight (gr)			2052.6 ± 786.2
Normal	82	30.9	
Low birth weight	183	69.1	

DISCUSSION

Frequency of severe preeclampsia

During our study period, the frequency of severe preeclampsia was 3.02%. It is higher than those noted by Hladunewich et al (9) in the United States with 1.4%, Hédon et al (61) in France 2%, Harioly et al (49) in Madagascar 1.3%, Minani (52) in Burundi 1.8. It is close to that reported by Aboussouf (51) in Morocco 2.4%. This difference noted compared to other authors could be justified in the fact that the type of methodology used in these countries which was multicentric and community. While ours was hospitable.

Treatment regimens used in the management of severe preeclampsia

Antihypertensive treatment, in our study, had been instituted in all pregnant women, contrary to the result reported by Tchaou et al (30) who noted that antihypertensive treatment had only been instituted in 93.2% of their patients. Most studies of severe preeclampsia report similar proportions of antihypertensive use. In our study, α-methyl dopa was the most widely used molecule (in all pregnant women). This use is similar to that used by Aboussouf (51) in Morocco who, in his study, α-methyl dopa was used in 99% of cases. The use of central antihypertensive drugs (α-methyl dopa) in our study, as also in the study by Aboussouf (51), could be explained by their efficacy, safety, affordability and especially their availability on the market. This is contrary to the finding of Diemunsch et al (29) in France who, in their study, rather found that nicardipine was the most used molecule (98%). The first-line use of nicardipine in France is explained by its dosage form, its handling and its duration of action. For Tchaou et al (30), clonidine was the most used molecule (68%). In our series, clonidine was used in only 18.1% of cases and nicardipine used in 8% of cases.

Anticonvulsants are given for prevention of seizures in SEP, treatment of seizures, and prevention of recurrence of seizures in eclampsia. Magnesium sulfate is the molecule recommended by WHO. In the study by Diemunsch et al (29) in France, MgSO4 was used in 86% of their pregnant women. On the other hand, Tchaou et al (30) in Benin, they instituted MgSO4 in 57% of their pregnant women. Our frequency of MgSO4 use was 70.2%. This frequency is within the range found by other authors. This would explain its availability on the market, its affordable cost, its easy-to-manage side effects.

The use of corticosteroids for the purpose of lung maturation is low in our study 23%, of this frequency Betamethasone was the most used in 70.5% of cases. The proportion of corticosteroid use reported by the other authors is in the range of 20 to 24%, in particular Hladunewich et al (9) in the United States with 24%, Hédon et al (61) in France 22.6%, El Koudia (50) in Morocco 20.8% and Minani (52) in Burundi 22%. Our use is similar to other authors in both low-resource and developed countries. This low proportion of corticosteroid use in all studies could be due to the fact that the majority of pregnant women consulted with a gestational age exceeding at least 33 weeks of amenorrhea, the age from which lung maturity is reached.

In terms of the combination of drugs in the management of severe preeclampsia, the regimen recommended by the WHO (62), which consists of anticalcics as first-line treatment, central antihypertensive drugs and other vasodilators as treatment of 2nd intention is applicable in several developed countries (27, 33). On the other hand in African countries, we note a diversity of the therapeutic regimens used. Our diagram is similar to those of certain African authors. However, it should be noted that in our environment all the molecules recommended by the WHO are used in a disparate way. This could be explained by the lack of codification in our environment, the cost and their availability on the market.

The most widely used treatment regimen in our series was the combination "α-methyl dopa + Nifedipine + MgSO4" in

52.1% (138 cases). This differs from the results reported by Magée et al (63) in 2012 in France and Tchaou et al (30) the same year in Benin who reported that the most used regimen was the combination of "Nicardipine + Clonidine + MgSO4" . In our series, this association was combined with α-methyl dopa and Diazepam used only in 3% of cases. In the literature, we have not found the comparison of molecules with the evolution of PES. We believe that evolution depends more on molecules.

Fetal-maternal prognosis

The fetal-maternal prognosis relates to the achievement of the blood pressure (BP) target which determines the route of delivery and the time of delivery depending on whether or not blood pressure levels have been normalized.

For pregnant women who responded to treatment for PA, delivery was at least 34 weeks old. Pregnant women who did not respond to treatment based on the PA response, delivery took place earlier than the 34th week for maternal rescue.

Most of the patients in our study had given birth by caesarean section in 69.4% of cases (184/265 cases) compared to 30.6% of those who gave birth vaginally, a result which is close to that of the Hind series (54), who found 69.9% for the high way and 31% for the low way and that of Minani (52), who found 66.1% for the high way. Our rate corresponds to the rate applied in Africa but lower than that of Palot et al (64) in France in 80% of cases. We note that the mode of delivery in our series was primarily caesarean section and primarily for maternal and fetal rescue. But in France, this would be linked to the consideration of the age of viability and their pediatric therapeutic arsenal. Rather, cesarean section is performed even after 24 weeks of amenorrhea.

APGAR at birth was good at 59.6% and it got better and better by the fifth and tenth minute. This is found in the range of results for Hédon (61) in France with 62% and Hind (54) in Morocco with 54%. A good APGAR reflects a certain fetal lung maturation for children who have benefited from corticosteroid therapy and / or for children born after 32 weeks and also by a good reception of our newborns by neonatal specialists despite the lack of sophisticated equipment.

The majority of newborns had a low birth weight, ie 69.1% of cases in our series. The average being 2052.6 ± 786.2 grams. This proportion is close to Tchaou in Benin in 2012 with an average of 2,500 ± 593 grams (30) and Minani in Burundi in 2011 with an average of 2,221.2 ± 673 (52). Our average deviates from the study by Hladunewich in the United States with 1562.3 ± 496.6 grams (9) where they have the means of efficient rearing for premature babies. The low birth weight in our series could be explained by the fact that the pathology leads to intrauterine growth restriction and a cesarean section for induced prematurity.

Our study was a descriptive retrospective cohort-type study by literature review. In view of these aspects, the creation of the database encountered a difficulty, the lack of information in certain files. Beyond these weaknesses, the present study has the merit of being the first to take stock of the management of severe pre-eclampsia in our setting.

CONCLUSION

At the end of our work on the evaluation of the management of severe pre-eclampsia at the University Clinics of Kinshasa, we drew the following conclusions. The frequency of severe pre-eclampsia was 3%. The most widely used treatment regimen in the management of PES was α-methyldopa + Nifedipine + MgSO4; Cesarean was the most common method of delivery.

Conflict of Interest

The authors declare no conflict of interest

Acknowledgements

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Author's Contributions

RVV and ANN designed and analyzed the statistical data for the study. MTC, VND, TVA, MNB, and MFS contributed to the data collection. RRT, MMJM, ME and LMB supervised the study. All authors have read and approved the final and revised version of the manuscript.

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