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## Research Article

### EPIDEMIO-CLINICAL PROFILE OF PREECLAMPS IN THE CITY OF GOMA, DEMOCRATIC REPUBLIC OF CONGO (DRC)

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#### ABSTRACT

**Introduction:** The purpose of our study was to report the epidemiological and clinical profile of preeclamps at Goma and to describe the maternal-fetal prognosis in relation to the different clinical presentations recorded.

**Methods:** This was a multi-center study conducted in four hospitals in Goma, North Kivu Province, from January 1, 2013 to December 31, 2017. Only pre-eclamps with no history of high blood pressure, and whose outcome was pregnancy was known were included.

**Results:** Ninety two pregnant women diagnosed with preeclampsia were enrolled, aged 18 to 42 years. For the period covered by this multi-center study, the prevalence of preeclampsia was 0.5%. Preeclampsia was common among pregnant women aged 20 to 34, married, at the secondary level, no profession, primigest, whose overweight term was overweight, having attended at least four antenatal visits, with edema of the lower limbs. The great prematurity was observed in all the primigestes. The mild form of preeclampsia was the most recorded and in the great majority the delivery was performed by caesarean section. In the majority of cases, a sufficient birth weight was noted in neonates of the preeclamptic mothers of the series. Half of newborn deaths and the only case of maternal death were attributed to the severe form of preeclampsia.

**Conclusion:** The pre-eclamptic profile of the city of Goma in the DRC, as well as the maternal-fetal prognostic elements coincide with those described by the majority of studies, especially African black literature. However, the prevalence recorded in this study appears to be much lower than that described by the majority of authors in the same region. A subsequent analytical study will identify the factors that may explain this low prevalence.

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#### INTRODUCTION

The entity that stands out immediately when talking about hypertension during pregnancy is preeclampsia. It remains one of the most complex hypertensive diseases and is recognized as responsible for most of the complications seen in hypertensive pregnant patients. Its place in the medical literature dealing with the pathologies of pregnancy is also in the image of the concerns it inspires obstetricians [1].

Preeclampsia is traditionally defined by the association of arterial hypertension and de novo proteinuria (greater than 300 mg / 24h) after 20 weeks of amenorrhea (WA) [2,3]. Despite progress in understanding its characteristic manifestations, pathophysiology remains a controversial area [4].

Among hypertensive disorders that constitute pregnancy complications, preeclampsia and eclampsia are major causes of maternal and neonatal morbidity and mortality [5]. Some authors report that preeclampsia occurs in 3 to 14% of all pregnancies worldwide, in 5-8% in the USA [6-8] where it accounts for about a quarter of premature medical deliveries [9], and in about 3 to 5% of cases in Western Europe [10]. In France, the incidence is estimated between 1 and 3% of pregnancies in nulliparas and between 0.5% and 1.5% in multiparas[11]. The incidence of preeclampsia is variable in Africa and is estimated for some countries at 2.23% in Ethiopia [12], 7.6% in Nigeria [13], 2.3% in Cameroon [14] and 1.27 % of severe preeclampsia in Benin [15].

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In DRC, the study conducted in Kinshasa on the prevention of preeclampsia in primigrava by Bangambe *et al* in 2009 revealed that the prevalence of this pathology was 12.5% [16]. In the same city in 2012, the incidences were 8.5% for preeclampsia and 1.8% for eclampsia [17].

Very little work has been done on the study of preeclampsia in the east of the country, and GOMA in particular. The factors related to this hypertension could be used for the definition of a local strategy of fight, or at least to direct the actions in various fields of fight. For all these reasons, we conducted a retrospective study in urban areas in Goma hospitals. The purpose of our study was to report the epidemiological and clinical profile of preeclampsia at Goma and to describe the maternal-fetal prognosis in relation to the different clinical presentations recorded.

## MATERIAL AND METHODS

This was a descriptive cross-sectional study with a retrospective data collection, conducted in the Gynecology-Obstetrics Department of the 4 Hospitals of the City of Goma, over a period from January 1, 2013 to December 31, 2017. It was North Kivu Provincial Hospital, General Reference Hospital Charity Kindergarten, Heal Africa Hospital and Kyeshero Hospital. During the study period, 92 cases of preeclampsia were collected from a total of 18 775 deliveries. All pregnant women admitted for preeclampsia, whose termination of pregnancy was known and who had a complete record were included in the study. Pregnant women with a history of high blood pressure or HBP prior to the 20th WA, non-hospitalized preeclampsia and those whose pregnancy termination was not known, cases of twin pregnancy or other related pathology, and pregnant women with records incomplete were excluded from the study. Preeclampsia was defined as the occurrence of hypertension at gestational age  $\geq 20$  weeks; blood pressure (taken after a rest period of at least 5 minutes, twice in succession at intervals of at least 4 hours) greater than or equal to 140 mmHg for systolic and/or 90 mmHg diastolic; and positive proteinuria; without history of hypertension.

The parameters studied were: age, marital status, occupation, educational level, pregnancy (number of pregnancies), admission method, gestational age (GA) in WA, antenatal visits, height and weight for the determination of the Body Mass Index (BMI), the presence or absence of lower limb edema (LLE), the mode of delivery, the condition and weight of the newborn as well as as the condition of the mother after delivery. The data has been processed and analyzed by Excel version 2007 and SPSS version 23.0.

## RESULTS

### Prevalence

For the period covered by this multi-center study, the prevalence of preeclampsia was 0.5%.

## Socio-demographic data

**Table I** Distribution of preeclampsia according to socio-demographic data

	Age (years)			Total n=92 (%)
	< 20 n (%)	20 - 34 n (%)	> 35 n (%)	
<b>Marital status</b>				
Married	6 (8,0)	61 (81,3)	8 (10,7)	75 (81,5)
Single	5 (29,4)	10 (58,8)	2 (11,8)	17 (18,5)
<b>Level of study</b>				
No	2 (22,2)	5 (55,6)	2 (22,2)	9 (9,8)
Primary	2 (22,2)	6 (67,7)	1 (11,1)	9 (9,8)
Secondary	6 (14,0)	34 (79,1)	3 (7,0)	43 (46,7)
College/University	1 (3,2)	26 (83,9)	4 (12,9)	31 (33,7)
<b>Profession</b>				
without	6 (10,3)	45 (77,6)	7 (12,1)	58 (63,0)
Worker	1 (4,2)	20 (83,3)	3 (12,5)	24 (26,1)
Schoolgirl and student	4 (40,0)	6 (60,0)	0 (0,0)	10 (10,9)

The mean age of the patients was  $27.5 \pm 6$  years (range, 18 to 42 years). Married (81.5%), high school (46.7%) and uneducated (63.0%) preeclampsia were the most represented and were predominantly age 20-34 years (Table I)

## Clinical data

**Table II** Distribution of preeclampsia according to clinical data

Mode of admission	Number of pregnancy			Total n=92 (%)
	1 n (%)	2 - 3 n (%)	$\geq 4$ n (%)	
Direct	50 (61,7)	20 (24,7)	11 (13,6)	81 (88,0)
Transfer	8 (72,7)	1 (9,1)	2 (18,2)	11 (12,0)
<b>Gestational age (WA)</b>				
< 33	4 (100)	0 (0,0)	0 (0,0)	4 (4,3)
34 - 37	20 (60,6)	11 (33,3)	2 (6,1)	33 (35,9)
$\geq 38$	34 (61,8)	10 (18,2)	11 (20,0)	55 (59,8)
<b>Antenatal visits</b>				
< 4	21 (72,4)	4 (13,8)	4 (13,8)	29 (31,5)
$\geq 4$	37 (58,7)	17 (27,0)	9 (14,3)	63 (68,5)
<b>BMI</b>				
Normal	11 (68,8)	2 (12,5)	3 (18,8)	16 (17,4)
Overweight	24 (63,2)	10 (26,3)	4 (10,5)	38 (41,3)
Grade 1	12 (54,5)	7 (31,8)	3 (13,6)	22 (23,9)
Grade 2	6 (60,0)	2 (20,0)	2 (20,0)	10 (10,9)
Grade 3	5 (83,3)	0 (0,0)	1 (16,7)	6 (6,5)
<b>LLE</b>				
Absent	20 (69,0)	6 (20,7)	3 (10,3)	29 (31,5)
Present	38 (60,3)	15 (23,8)	10 (15,9)	63 (68,5)
<b>Severity of PE</b>				
Moderate	49 (67,1)	15 (20,5)	9 (12,3)	73 (79,3)
Severe	9 (47,4)	6 (31,6)	4 (21,1)	19 (20,7)
<b>Delivery route</b>				
Natural	15 (57,7)	8 (30,8)	3 (11,5)	26 (28,3)
Caesarean	43 (65,2)	13 (19,7)	10 (15,2)	66 (71,7)

Preeclampsia had reached the primigest (63%). The majority of preeclampsia had directly consulted the hospitals concerned by our study (88.0%). Mean gestational age for preeclampsia was  $37.3 \pm 2.03$  weeks (range: 30 to 40 weeks). The great prematurity was observed in all primigestes but the pregnancy was eventually 59.8% of cases. At least 4 sessions of antenatal visit were followed in 68.5% of cases and in 71.7% of cases, the vast majority, the delivery by caesarean section. BMI was dominated by overweight (41.3%), lower limb edema was present in 68.5% of preeclampsia. The light form of preeclampsia was the most recorded (79.3%). All these major clinical characteristics were found in the primigest.

## Neonatal and maternal data

**Table III** Distribution of Preeclampsia by Newborn and Mother Data

	Preeclampsia		
	Moderate	Severe	Total
Weight of newborn (g)	n (%)	n (%)	n=92 (%)
< 2500	26 (86,7)	4 (13,3)	30 (32,6)
2500 - 3500	40 (75,5)	13 (24,5)	53 (57,6)
> 3500	7 (77,8)	2 (22,2)	9 (9,8)
Newborn situation			
Living	65 (81,3)	15 (18,8)	80 (87,1)
Dead	8 (66,7)	4 (33,3)	12 (13,0)
Mother situation			
Living	73 (80,2)	18 (19,8)	91 (98,9)
Dead	0 (0,00)	1 (20,7)	1 (1,1)

In the majority of cases, a sufficient birth weight was noted in neonates of the preeclamptic mothers of the series. Half of newborn deaths and the only case of maternal death were attributed to the severe form of preeclampsia.

**DISCUSSION**

The prevalence of preeclampsia was 0.5% for the period considered in this study. Considering the African literature, the prevalence of our series was lower than those reported by several authors: 7.6% by Anorlu R. *et al* in Nigeria [13], 1.27% of severe preeclampsia in Benin [15], 2.3% by Gregory Edie Halle-Ekane in Cameroon [14], 2.2% by Ravoavison N *et al* in Antananarivo [18] and 2.23% 2015 by Vata PK *et al* in Ethiopia [12]. We believe that the observed differences are related to the wide variety of populations studied.

The 20 to 34 age group was the most affected by preeclampsia. Compared with the studies of some authors, Grum T *et al* in Addis Ababa also found that the majority of our preeclamps were aged 20 to 34 years [19]. In contrast, 58.5% of patients were aged 30 to 39 in Cotonou [15]. This age group is considered to be the woman's full period of genital and economic activity. This statement was also made by Takongmo *et al* [20].

Married patients were the most represented in our study. This observation was made by other authors: Harioly M.O.J. *et al* in Madagascar [21], Minani P. in Bujumbura [22] and Essam A. *et al* in Egypt [23] where preeclamps were also in the majority. The level of secondary study was reached or completed by the majority of patients in our series. The same observation was made by Harioly M.O.J. *et al* [21]. On the other hand, in the study by Mariem S.M. *et al* in Mauritania, 40% of preeclamptic pregnancies, the majority, had reached a primary level, and 18% had not attended school [24]. We do not think there would be a relationship between preeclampsia rate and level of education.

Household preeclamps (without occupancy) were the most represented. Observation also made by Harioly M.O.J *et al* [21] and Mariem S.M. *et al* in Mauritania [24].

Preeclampsia had reached the primigest (63%) in which the majority of the clinical characteristics studied were found: direct consultation (88.0%), very prematurity (100%), pregnancy was term (59.8%), at least 4 sessions of prenatal follow-up (68.5%), overweight (41.3%) and lower limb edema (68.5%), the mild form of preeclampsia was the most recorded (79.3%) and caesarean section (71.7%).

As in our study, Geyl C. *et al* reported that preeclampsia was more prevalent in primigest (69.7%) [25]. Our results differ from those of Mariem S.M. *et al* who found that 62% of preeclamps were multi-gestate (greater than 3 pregnancies) [24]. The same is true for Kiondo P. *et al* in Kampala whose results had found a predominance of multigestes ( $\geq 5$  pregnancies) [26]. And according to many studies, it constitutes a considerable risk factor in the development of the disease [27, 28], a finding that we supported in our study. The majority of the cases had directly consulted the hospitals selected for our study. In many cases, Rakotomalala Z. *et al* found that the disease was only diagnosed on admission to hospital for patients coming on their own for work or complications of hypertension. for which they were not informed [29]. Regarding the term of pregnancy, our results are close to those of Sengeyi *et al* in Kinshasa with 71% [30] and Mboundou *et al* in Yaoundé with 77.88% [31]. Rakotomalala Z. *et al* found a predominance of preeclampsia (63%) at gestational age greater than or equal to 37 WA [29]. Contrary to our results, the study of Haddad B. *et al* found a term inferior to 30.4 weeks of gestation [32].

The prenatal consultations were followed at least 4 times by our majority of preeclamps. The same observation was made by Mboundou E.T. *et al* who, in view of the complications recorded in their study, had stated that it was quality that mattered more and not the number of consultations [31]. Our finding is justified by the urban location of the hospitals concerned by the study, and by the level of education of pregnant women, the majority of whom go beyond the primary level.

A positive association between maternal obesity and preeclampsia is recognized in black women according to Mahomed K. *et al* [33]. These results above do not differ from ours. In contrast, obesity was not considered a risk factor for pre-eclampsia in Kiondo P. *et al*'s study in Uganda [26]. The association between the risk of preeclampsia and obesity has also been demonstrated in various populations around the globe, supporting the concept that weight loss reduces the risk of this disease [34].

As in our study, edema of the lower limbs was found in the majority of patients in a reference urban hospital in Dakar, Senegal [35]. The presence of edema of the extremities and the face is no longer a criterion belonging to the definition of preeclampsia, many authors no longer mention.

Caesarean section was the most common mode of delivery, as in the study of Koffi A. *et al* in Abidjan [36]. Caesarean section was extremely high in the Vata *et al* study in Ethiopia (88.93%) [12]. Haddad B. *et al* state that it would be desirable, from 37 - 38 weeks, to schedule birth by natural means or by cesarean section depending on the presentation, the Bishop's score, and whether or not the scar is scar. uterus [32]. Since the majority of preeclampsia was diagnosed in our study, we believe that caesarean section was the most common mode of delivery because it offers less risk to the mother and the fetus, especially since preeclampsia is also a complicated form of HBP.

We have 12% fetal death in our study. In Laghzaoui's multi-center study in Moroccan hospitals, fetal death was between 7.0% and 27.8% of deliveries [37]. Vata *et al* in Ethiopia reported 9.3% stillbirth in their study [12]. The consequences

of preeclampsia were dominated by fetal death in Antananarivo, Madagascar in 2015 (23.5% of cases) [18].

The weight of the newborn was generally between 2500 and 3000g. In the majority of cases, the patients had consulted directly with the hospitals, the pregnancy was complete, the minimum of antenatal visit as recommended by the WHO was followed, the preeclampsia was of light form. We dare to believe that he would have a relationship with this slice of sufficient weight recorded in this study.

Only one case of death was recorded in preeclampsia in our study. According to Winner *et al*, the maternal death remains a rare tragedy but unfortunately still experienced by families and care teams who misunderstand how we can die nowadays just because of pregnancy [38].

We believe that the death was rare because the hospitals selected for this study are sufficiently equipped, but also because of the presence of at least one obstetrician gynecologist in each structure.

## CONCLUSION

Preeclampsia remains a cause of maternal morbidity and mortality. While adequate care has improved the maternal and fetal prognosis in developed countries, the problem persists in low-income countries due to the scarcity of qualified personnel, lack of availability of medicines and poverty. Under these conditions, knowledge of the pre-eclamptic profile would prevent disease, or at least complications, in pregnant women at risk.

Indeed, the pre-eclamptic profile of the city of Goma in the DRC, as well as the elements of the maternal-fetal prognosis coincide with those described by the majority of studies, especially African black literature. However, the prevalence recorded in this study seems much lower than that described by the majority of authors, especially African. The next analytical study will identify the factors that may explain this low prevalence.

## Competing interest

The authors declare no competing interest in carrying out this study

## Authors's contributions

Kyembwa M. wrote the first draft. All authors contributed to writing and revising of drafts; performed critical reviews of manuscript for intellectual content and approved the final manuscript.

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