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High Blood Pressure and Pregnancy: Epidemiological, Clinical, and Therapeutic Aspects at the University Hospital Center of Libreville from August 1, 2022 to July 31, 2023

Jean Pierre Ngou Mve Ngou*, Stofel Sapolo Pumpu, Kevin Ngou Mve Ngou, Nathalie Ambounda, Marcel Metogo

Gynecology-Obstetrics Department, University Hospital Center of Libreville, Libreville, Gabon
Email: *ngoumvengou@gmail.com

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Abstract

Objective: To study the epidemiological and clinical aspects of high blood pressure and pregnancy at the University Hospital Center of Libreville from August 1, 2022 to July 31, 2023. **Patients and method:** This cross-sectional analytical study reviewed all complete records of women admitted to the high-risk pregnancy unit with hypertension between 1 August 2022 and 31 July 2023 at the University Hospital Center of Libreville (CHUL). Gestational hypertension was defined as new-onset blood pressure ≥ 140/90 mm Hg on two occasions at least 4 h apart after 20 weeks' gestation without proteinuria; pre-eclampsia as hypertension plus proteinuria ≥ 300 mg/24 h or protein/creatinine ratio ≥ 0.3 or dipstick ≥ 1+ or signs of maternal organ dysfunction; chronic hypertension as hypertension predating pregnancy or diagnosed before 20 weeks' gestation; and superimposed pre-eclampsia as chronic hypertension with new-onset proteinuria or maternal organ dysfunction. Blood pressure was measured by trained staff using an automated device, in the seated position after a 5 min rest, and two readings were averaged. Outcomes included mode of discovery, clinical form, risk factors and complications. Chi-squares tests were used to examine associations, with significance set at $p < 0.05$. **Results:** Hypertensive disorders of pregnancy represented 20.6% (n = 231) of parturient admitted to the high-risk maternity-unit. The average age was 29.5, (range 15 - 44). High blood pressure was more common in the 10 -

19-year age group (41.9%), followed by the 20 - 29-year group (35.4M). It was most often discovered incidentally during prenatal consultations or when a pregnancy complication occurred. Pre-eclampsia (59.7%) and gestational hypertension (37.2%) were the most represented clinical forms. Primigravidity (72.2%) and personal or family history of hypertension (15.6%) were common. Maternal complications occurred in 12% of cases, chiefly eclampsia and retroplacental hematoma. **Conclusion:** Hypertensive disorders of pregnancy remain frequent in Libreville and are dominated by pre-eclampsia. Strengthened antenatal screening and management are needed.

Keywords

High Blood Pressure, Pregnancy, Libreville, Gabon

1. Introduction

High blood pressure is responsible for about ten million deaths per year worldwide. It affects 5 to 10% of pregnant women, and its screening is systematic in prenatal consultation. It is the leading cause of maternal and fetal morbidity and mortality, and the second reason for admission of pregnant women to intensive care [1]. Hypertension is responsible for 30% of maternal deaths and 20% of fetal and neonatal mortality in Africa, compared to 16% of maternal deaths in developed countries [2].

Mortality was estimated at 12/100,000 for women with hypertension compared to 2.8/100,000 for women with normal blood pressure. High blood pressure is experiencing a worrying progression in sub-Saharan Africa in general, and in Gabon in particular [3].

Recent evidence shows that hypertensive disorders of pregnancy (HDP) remain a significant burden across sub-Saharan Africa. A 2024 meta-analysis of facility-based studies estimated that HDP affect approximately 8 % of pregnancies in sub-Saharan Africa [4]. This pooled prevalence is higher than the prevalence reported in the World Health Organization multi-country survey (2.7%) and reflects heterogeneity in diagnostic criteria and late presentation to care. Recent facility-based studies illustrate this burden: a 2023 cross-sectional study in Ghana reported a preeclampsia prevalence of 8.8 % among 1 174 pregnant women and identified primigravidity as an independent risk factor (adjusted odds ratio 1.95; 95% CI 1.03 - 3.71) [5]. In Nigeria, a 2023 survey of pregnant women found high rates of newly diagnosed hypertension and inadequate antihypertensive therapy [6]. These reports underscore the need for early detection and management of HDP in our region. Furthermore, quality-improvement interventions can improve outcomes; for example, a 2025 quasi-experimental study at a Canadian tertiary center showed that implementing standardized severe hypertension management protocols increased the proportion of women achieving target blood pressure within 60 minutes and improved use of appropriate antihypertensive medications [7].

High blood pressure is the most common cardiovascular complication of pregnancy, affecting 5% to 10% of pregnant women. It is associated with maternal, fetal, and neonatal morbidity and mortality, intrauterine growth retardation, prematurity, or even death in utero, especially in severe forms represented by preeclampsia and eclampsia, which account for 14% of maternal mortality during pregnancy [8].

2. Patients and Method

It was an analytical, cross-sectional, and descriptive study. The University Hospital Center of Libreville is the largest and most important hospital in Gabon; it has several specialties, including an adult resuscitation and neonatology unit.

The gynecology-obstetrics department is an independent unit that handles approximately 6,000 deliveries annually. This department includes three maternities with a total capacity of 76 beds. The high-risk or pathological pregnancies unit has a capacity of 28 beds.

2.1. Period and Duration of the Study

This study took place from August 1, 2022, to July 31, 2023, *i.e.*, a duration of 1 year.

2.2. Study Population

1. The target population

The target population included all inpatients in maternity ward C.

2. Inclusion criteria

a) Diagnosis of hypertensive disorder of pregnancy; admission to and management at CHUL (Maternity Ward C) during the study period.

b) Complete medical record.

3. Exclusion criteria

a) The referred cases of high blood pressure and pregnancy requiring in utero transfer.

b) Incomplete files.

4. Source and data collection techniques

Data were gathered from maternity C registers and parturient files using a standardized form.

Blood pressure measurements were performed by trained healthcare providers using an automated sphygmomanometer after the patient had rested for at least five minutes in a seated position with the arm supported. Two readings were taken four hours apart and the mean value was recorded. Gestational hypertension was defined as new-onset blood pressure ≥ 140/90 mm after 20 weeks' gestation without proteinuria; pre-eclampsia as hypertension plus proteinuria ≥ 300 mg/24 h or protein/creatinine ratio ≥ 0.3 or dipstick ≥ 1+ or signs of maternal organ dysfunction.

2.3. Interest Variables

Socio-demographic reproductive traits of parturient included age, occupation,

marital status, health insurance, parity, gravidity, number of living children, and antecedents.

High blood pressure in pregnancy was characterized by discovery mode, gestational age, proteinuria, blood pressure levels, edema, and weight.

Complications of arterial hypertension in pregnancy included maternal issues (neurological, digestive, eclampsia, retroplacental hemorrhage, pulmonary edema, renal failure, HELLP syndrome, death) and fetal complications (growth retardation, prematurity, low birth weight, acute distress, or fetal death).

2.4. Study Procedures

Prior to data collection, we conducted a literature review and developed a research protocol and a standardized data-collection form. The maternity ward registers and patients' medical records were made available for date abstraction.

2.5. Seized Collection and Statistical Analysis

Data were gathered and recorded using Word and spreadsheet applications. Excel was used for data storage, and statistical analysis was performed with Epi Info 10 software.

The calculations carried out included descriptive statistics (means and proportions), the chi-square test and calculation of p-values.

2.6. Ethics

The confidentiality and anonymity of patients were respected in accordance with the regulations of the Gabon Ethics Committee and the Director CHUL.

3. Results

Of the 1,118 parturients hospitalized in the high-risk pregnancy unit (Maternity C), 231 had hypertension associated with pregnancy, a frequency of 20.6%. This denominator reflects admissions to the high-risk unit rather than all deliveries at the University Hospital Center and therefore cannot be interpreted as population prevalence.

The average age was 29.5 years. The age groups of (10 - 19), (20 - 29), (30 - 39), and (40+) represented respectively, 41.9%, 35.4%, 13.8%, and 8.6% of parturients (**Table 1**).

Of all women, 62.3% lived with a partner—13.4% were married and 48.9% in concubinage while 37.7% were single. Among participants, 87% were covered by the National Health Insurance and Social Security Fund whereas 13% lacked health insurance coverage. Regarding current activity, 31.6% were students while 29.4% were employed and 38.9% were housewives or employed. In terms of education, 61% had some formal schooling.

Arterial hypertension was found in 72.7% of primigravid women and in 27.3% of multigravidae. It occurred in 30.7% of nulliparous, 26.4% of pauciparous 23.8% of primiparous 14.2% of multiparous and 4.8% of grand multiparous women.

Of the parturients, 59.7% had one living child, 9.5% had more than five, and

30.7% had none.

A total of 36 patients (15.6%) had a personal (10) or family history (26) of hypertension. Pre-eclampsia accounted for 59.7% of cases, followed by pregnancy hypertension at 37.2%, chronic hypertension at 0.9%, and pre-eclampsia added at 2.2%.

Two major maternal complications were observed: eclampsia in 18 cases (7.8%) and retroplacental hematoma in 8 cases (3.5%). Most hypertensive parturients (87.9%) had no complications, and no maternal deaths due to hypertension occurred in this study (Table 2).

Hypotrophy occurred in 22 cases (9.5%), MFIU in 21 cases (9.1%), acute fetal suffering in 6.5%, and prematurity in 2.3% of pregnancies. Over 72.3% had no fetal complications (Table 3).

A favorable fetal prognosis was observed in 75.4% of births, with 41.6% having an Apgar score of 10 at 5 minutes and 33.8% achieving the same score at 1 minute. Additionally, 11 newborns (4.8%) had a 1-minute Apgar score below 7, while 23 (10%) scored above 7 at 5 minutes.

Of 231 cases, 229 (99.1%) had gestational ages over 20 SA; only 2 (1%) were under 20 SA.

A birth weight exceeding 2500 g was recorded in 148 newborns, while a birth weight below 2500 g was observed in 83 newborns, accounting for 36% of the total. This study recorded 23 neonatal deaths (10%). There were 3 transfers in neonatology (1.3%). In addition, progressive pregnancies numbered 6 (2.6%).

Among the parturients, 51.5% attended between one and four prenatal consultations. A further 41.1% had five to seven consultations, while 7.4% underwent more than eight prenatal visits.

Physical signs were represented by edema in 35.9% of cases, and associated neurosensory signs were present in 4.3%. The mode of discovery was fortuitous in 59.7% of cases. The urinary strips performed in 231 parturients showed positive proteinuria in 144 cases (62.3%) and negative in 87 parturients (37.7%).

Table 1. Association between age and maternal complications.

Age group (years)	Maternal complications (Yes, n)	No maternal complications (n)	Total (n)	P-value	OR (95% CI)	Chi2
≥20	19	180	199	0.00	0.26 (0.10 - 0.66)	8.93
10–19	9	23	32	—	1	—

Note: p = 0.00 < 0.05 The data suggest an association between age and maternal complications.

Table 2. Association between parity and maternal complications.

Parity	Maternal complications (Yes, n)	No maternal complications (n)	Total (n)	P-value	OR (95% CI)	Chi2
≥1	17	143	160	0.22	0.7 (0.31 - 1.67)	0.57
Nulliparous	10	61	71	—	1	—

Note: p = 0.22 > 0.05. Parity does not affect maternal complications.

Table 3. Association between age and fetal complications.

Age group (years)	Fetal complications (Yes, n)	No fetal complications (n)	Total (n)	P-value	OR (95% CI)	Chi2
≥30	30	87	117	0.34	1.23 (0.48 - 3.13)	0.19
20 - 29	27	55	82	0.12	1.75 (0.67 - 4.56)	1.34
10 - 19	7	25	32	—	1	—

Note: P > 0.05. Age does not affect fetal complications.

4. Discussion

4.1. Study Limitations

During this retrospective study, we encountered incomplete recorded information in consultation charts and ward registers; missing socio-demographic and therapeutic data led to the exclusion of some records. The retrospective design also introduces potential selection/information bias, as key variables-such as the spouse's age and occupation and the time to emergency-department care following an abortion procedure-were frequently undocumented.

In addition, several potential confounders were not measured. Maternal obesity, diabetes, chronic kidney disease and smoking are known to increase the risk of hypertensive disorders and adverse pregnancy outcomes, yet these factors were not systematically recorded in our dataset. Their omission may have introduced residual confounding that could affect observed associations and prevalence estimates. Future prospective studies should collect comprehensive data on metabolic and lifestyle factors to better quantify their impact on maternal and fetal outcomes.

4.2. Association between Socio-Demographic Factors and Maternal Complications

1. Age:

Maternal complications were significantly associated with age ($\chi^2 = 8.93$, $p < 0.001$). Compared with adolescents aged 10 - 19 years, women aged ≥ 20 years had lower odds of maternal complications (OR = 0.26; 95% CI 0.10 - 0.66), *i.e.*, about a 74% reduction.

2. Marital status:

Marital status was significantly associated with maternal complications (p = 0.03). Compared with unmarried women, those living with a partner had lower odds of maternal complications (OR = 0.47). This association is observational and may reflect residual confounding (e.g., age, parity, socioeconomic support, health-seeking behavior) rather than causal effects.

3. National Health Insurance and Social Security Fund

The association between insurance status and maternal complications did not reach statistical significance (p = 0.05). Emergency hospitalization fees are waived at our institution; patients are systematically managed in the gynecologic-obstet-

ric emergency department irrespective of insurance affiliation. This practice likely attenuates any measurable effect of insurance status on the risk of maternal complications.

High blood pressure occurred in 20.6% of pregnancies in this study, exceeding the rate reported by Thiam *et al.* in Senegal [9].

Regarding education, 61% had some formal schooling, compared with 100% in the series by Samaké *et al.* [10]. The proportion married was 13.4%, markedly lower than reported by Samaké *et al.* [10].

In our cohort, the high proportion currently in education and the very low proportion married likely reflect a younger age distribution and rising female educational attainment, including among employed women. A similar pattern was noted by Aukes *et al.* [11]. Nonetheless, in many settings across the region the predominance of hypertensive disorders may be linked to early marriage and its corollary, adolescent pregnancy.

In high-income settings, the prevalence of pre-eclampsia is about 1% - 5% [12], but it can reach 20% - 40% in women with pre-existing chronic hypertension or moderate renal disease (e.g., diabetic nephropathy). In our cohort, maternal complications among women with hypertensive disorders of pregnancy occurred in 28/231 cases (12.1%), with eclampsia being the most frequent. This mirrors the findings of Fong *et al.* [13], whereas Lisonkova *et al.* [14] reported placental abruption as the leading complication, which was less common in our series.

No maternal deaths occurred during the study period, consistent with reports from high-income settings where maternal death is rare [15]. In California, Canada, and the Netherlands, eclampsia-related maternal mortality has been reported as low: 0.63%, 0.34%, and 1.4%, respectively [16]. In our series, there were 23 perinatal deaths. Although overall perinatal mortality is relatively low in high-income countries [17], it remains substantial among pregnancies complicated by eclampsia [18]; for example, a Finnish series reported ≈ 6 perinatal deaths per 100 eclampsia cases [19].

5. Conclusion

Hypertensive disorders of pregnancy remain common in our setting, with pre-eclampsia as the predominant phenotype. These conditions drive substantial maternal and perinatal morbidity, notably eclampsia and stillbirth. Prevention and mitigation require risk stratification, systematic antenatal screening (standardized blood-pressure/proteinuria assessment), timely referral, and evidence-based obstetric and neonatal care.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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