

# Prevalence of Types of Arterial Hypertension in Pregnant Women at the Maternity Ward of the Centre Médical Communal Les Flamboyants Conakry Guinea

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## Abstract

**Introduction:** Arterial hypertension (AH) during pregnancy is defined as systolic blood pressure greater than or equal to 140 mm Hg and/or diastolic blood pressure greater than or equal to 90 mm Hg on two (2) successive visits separated by at least 4 hours in a woman who has been at rest for 10 to 15 minutes in the seated position and then in the left lateral decubitus position. The aim of this study was to determine the prevalence and types of arterial hypertension among pregnant women in the maternity ward of the CMC les Flamboyants. **Methods:** This was a prospective descriptive study lasting six (6) months, from 1 October 2021 to 31 March 2022, of all pregnant women and/or parturients admitted to the maternity ward of the CMC les Flamboyants with a resting blood pressure (BP) greater than or equal to 140/90 mm Hg during the study period. **Results:** During the study period, we recorded 707 cases of pregnant and/or parturient women, 50 (7.07%) of whom were hypertensive. The average age of the patients was 29 years, with extremes of 18 and 41 years. The 20 - 29 age group was the most affected, with 26 cases (52%). Headache, dizziness and oedema of the lower limbs were constant in all cases. The risk factors for arterial hypertension were dominated by familial hypertension in 19 cases (38%), multiple gestures in 17 cases (34%) and a history of gestational hypertension in 16 cases (32%). Gestational age between 28 and 36 weeks' amenorrhoea was the most common, with 20 cases (40%). Type I hypertension was most common on admission, with 34 cases (68%), followed by type II hypertension, with 8 cases (16%). Pre-eclampsia was the most frequent maternal complication with 27 cases (54%) followed by

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eclampsia with 15 cases (30%). Fetal distress was the most frequent fetal complication, 19 cases (38%), followed by death in utero 9 cases (18%). **Conclusion:** Compliance with consultation programmes and correct patient follow-up could help reduce maternal-foetal complications.

### Keywords

Hypertension, Pregnant Women, Maternity Unit, Conakry Guinea

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## 1. Introduction

Arterial hypertension (AH) during pregnancy is defined as a systolic blood pressure greater than or equal to 140 mm Hg and/or a diastolic blood pressure greater than or equal to 90 mm Hg on two (2) successive visits separated by at least 4 hours in a woman who has been at rest for 10 to 15 minutes in the seated position and then in the left lateral decubitus position [1].

High blood pressure during pregnancy may be the result of two completely different circumstances [2] [3]. Either the hypertension existed before pregnancy, corresponding to chronic hypertension, whether essential or secondary to a particular cause, such as renal or adrenal hypertension [4] [5]; or it is a case of hypertension which appeared during pregnancy, corresponding to two pathological situations, which may occur successively: isolated gestational hypertension and, when associated with proteinuria, pre-eclampsia [1] [5].

The American College of Gynecology defines four types of gestational hypertension: pre-eclampsia or toxemia gravidarum, chronic hypertension, chronic hypertension with added pre-eclampsia and transient hypertension [1] [6].

The risk of recurrence of hypertension in subsequent pregnancies is 20% to 50% and that of pre-eclampsia 20% to 25% [7] [8].

In Togo in 2014 Baragou *et al.* [9] reported that the prevalence of hypertension during pregnancy was 12.3%. Pregnant AH accounted for 33%, pre-eclampsia 44%, chronic AH 10% and superadded pre-eclampsia 13%.

In Guinea in 2015 Keita [10] reported that the prevalence of hypertension during pregnancy was 4.13% at Kankan Regional Hospital, with 40% pre-eclampsia, 28% transient hypertension, 19% superadded pre-eclampsia and 13% chronic hypertension.

High blood pressure during pregnancy is associated with complications of varying degrees of severity, both for the mother and the child [4] [11] [12].

The treatment of hypertension during pregnancy includes non-pharmacological means—low-salt diet, physical activity and weight loss are not recommended, given the lack of convincing evidence demonstrating their benefit in improving fetal or maternal prognosis [13].

Maternal mortality is multiplied by 4.8; foetal death in utero is twice as frequent as outside pregnancy, and perinatal mortality is 11% [11].

The aim of this study was to determine the prevalence of types of arterial

hypertension in pregnant women at the CMC les Flamboyants maternity unit.

## 2. Material and Methods

This was a six (6)-month prospective descriptive study conducted at the maternity ward of the Centre Médical Communal les Flamboyants (Guinea Conakry), running from 1 October 2021 to 31 March 2022.

All pregnant women and/or parturients with a resting blood pressure (BP) PAS  $\geq$  140 mm Hg and/or a DBP  $\geq$  90 mm Hg who agreed to participate in the study on informed consent were included in this study.

Not included were all pregnant women admitted to the department with a blood pressure less than or equal to 139/89 mm Hg (without any antihypertensive treatment) and those who did not agree to participate in the study.

Our variables were quantitative and qualitative, broken down into data: for each patient, the investigator collected information on a pre-established form during an individual interview:

1) Social and demographic data (age, marital status, level of education, employment status, area of residence, mode of admission).

2) Clinical data:

The reasons for consultation sought were: headaches, dizziness, epigastralgia, epistaxis, dyspnoea, palpitations, metrorrhagia, seizures, oedema of the lower limbs and vomiting.

Maternal complications sought were: pre-eclampsia or toxemia gravidarum, eclampsia, retroplacental haematoma, acute pulmonary oedema, acute renal failure and HELLP syndrome.

Fetal complications sought: fetal hypotrophy, prematurity, fetal distress, fetal death in utero, neonatal death.

Risk factors for hypertension (primigravida, familial hypertension, length of time with partner, use of oestrogestins, obesity, twin pregnancy, gestational age, pregnancy less than or equal to 20 SA, pregnancy between 20 and 27 SA, pregnancy between 28 and 36 SA, pregnancy greater than or equal to 37 SA).

Types of hypertension on admission:

We adopted the classification of the American College of Gynecology-Obstetrics which defines four (4) types [1] [6].

Type I: pre-eclampsia or gestational toxemia: was evoked in the presence of a syndrome associating hypertension; proteinuria greater than or equal to 300 mg/24H; with or without oedema of the lower limbs, usually occurring after the 20th gestational age.

Type II: has been suggested in the presence of chronic hypertension in women known to be hypertensive before pregnancy or detected before the 20th week of amenorrhoea.

Type III: pre-eclampsia added to chronic hypertension: this type is made up of type II patients who develop an accelerated phase of their disease during the 3rd trimester of pregnancy with the appearance of significant proteinuria (greater

than or equal to 300 mg/24H).

Type IV: evoked in patients presenting with isolated hypertension, without proteinuria, which appears with each pregnancy and disappears with it.

3-Paraclinical data were: urea, creatinine, CBC, BU, blood ionogram, transaminases, serology (HIV and HBsAg).

Data collection, entry and analysis:

Data were collected manually on a survey form. Data entry and analysis were carried out using Epi info 7.1.14 software.

Tables, graphs and word processing were carried out using Excel and Word 2013.

Ethical considerations:

The agreement of the department managers was obtained before the start of the surveys. A working protocol was drawn up and validated by the hospital authorities and the Chair of Nephrology. Free and informed consent was obtained from the parturients, with respect for confidentiality and anonymity, in accordance with medical ethics.

### 3. Results

During our study period, we recorded 707 cases of pregnant women. Fifty patients (7.07%) had a resting blood pressure (BP) greater than or equal to 140/90 mm Hg. The mean age of our patients ranged from 18 to 41 years, with an average of 29 years. The 20 - 29 age group was the most affected, with 26 cases (52%). Housewives were the most common socio-professional group in 21 cases (42%), followed by professionals in 18 cases (36%) and civil servants in 7 cases (14%). More than half of our patients had not attended school 26 cases (52%) and only 3 cases (6%) had attained higher education. Seventeen of our patients (34%) were pauci parous and 4 cases (8%) were grand multiparous (**Table 1**). Headache, dizziness and oedema of the lower limbs were constant in all cases. The risk factors for arterial hypertension were dominated by familial hypertension in 19 cases (38%), multiple gestations in 17 cases (34%) and a history of gestational hypertension in 16 cases (32%). The gestational age range of 28 to 36 weeks' amenorrhoea was the most common, represented by 20 cases (40%). Type I hypertension was the most common, with 34 cases (68%) and type II hypertension 8 cases (16%). Pre-eclampsia was the most frequent maternal complication with 27 cases (54%), followed by eclampsia with 15 cases (30%). Fetal distress was the most common fetal complication, 19 cases (38%), followed by death in utero 9 cases (18%) and prematurity 4 cases (8%) (**Table 2**).

Biological test results showed hyperglycaemia in 7 cases (14%), elevated creatinaemia in 5 cases (10%), viral hepatitis B in 6 cases (12%) and positive HIV serology in 2 cases (4%). More than 4/5 of the patients had proteinuria in 42 cases (84%), including 14 cases (28%)+++, 15 cases (60%)++ and 13 cases (26%)+, and it was normal in 8 cases (16%) (**Table 3**). Medical treatment was dominated by Aldomet 500 mg in 37 cases (74%) and magnesium sulphate in 14 cases (28%).

**Table 1.** Distribution of patients according to epidemiological data.

Socio-demographic data	Number	%
Women without ATH	657	92.93
Women with hypertension	50	7.07
<b>Age group</b>		
<20	3	6
20 - 29	26	52
30 - 39	18	36
≥40	3	6
<b>Profession</b>		
Household	21	42
Liberal	18	36
Civil servants	7	14
Pupils/students	4	8
<b>Level of education</b>		
No schooling	26	52
Primary	12	24
Secondary	5	10
Vocational	4	8
Higher	3	6
<b>Parity</b>		
Paucipare	17	34
Multiparous	13	26
Primiparous	11	22
Nulliparous	5	10
Large multiparous	4	8

**Table 2.** Distribution according to clinical data.

Clinical data	Number	%
<b>Reasons for consultation</b>		
Headache	50	100
Vertigo	50	100
Edema of the lower limbs	50	100
Dyspnoea	27	54
Palpitation	26	52
Convulsive seizures	15	30
Epigastralgia	5	10
Metrorrhagia	5	10
<b>Risk factors</b>		
Familial hypertension	19	38
Multiple gestures	17	34
Previous pregnancy-induced hypertension	16	32
Stress	16	32

## Continued

Low socio-economic status	13	26
Taking oral contraceptives	12	24
Primacy	11	22
Obesity	5	10
Twin pregnancies	1	2
<b>Gestational age (SA)</b>		
<20	6	12
20 - 27	10	20
28 - 36	20	40
>36	14	28
<b>Types of hypertension on admission</b>		
Type I	34	68
Type II	8	16
Type III	4	8
Type IV	4	8
<b>Maternal complications</b>		
Pre-eclampsia	27	54
Eclampsia	15	30
Retroperitoneal haematoma	4	8
Acute renal failure	3	6
<b>Fetal complications</b>		
Fetal distress	19	38
Death in utero	9	18
Prematurity	4	8
Fetal hypotrophy	4	8
Neonatal death	1	2

**Table 3.** Distribution of paraclinical data.

Biological tests		Number	%
Blood glucose	Normal	6	12
		37	74
	Hyperglycaemia	7	14
Creatinine	Normal	45	90
	High	5	10
HIV	Negative	48	96
	Positive	2	4
HBsAg	Negative	44	88
	Positive	6	12
Proteinuria			%
	1+		26
	2+		<b>30</b>
	3+		28
	Normale	8	16

More than 2/3 (76%) of patients had a length of stay of more than 72 hours, with an average stay of 98.4 hours and extremes of one hour and 168 hours (Table 4).

#### 4. Discussion

During the study period, we recorded 707 cases of pregnant and/or parturient women admitted to the department, of whom 50 cases (7.07%) had a resting blood pressure (BP) greater than or equal to 140/90 mm Hg. This result is lower than that of Niamkey *et al.* [14] in 2007 in Côte d'Ivoire, who reported a prevalence of 8.4%.

The mean age of the patients was 29 years, with extremes of 18 and 41 years. The 20 - 29 age group was the most affected, with 26 cases (52%). Keita [10] in 2015 at the Kankan Regional Hospital reported an average age of 24 years, with extremes of 15 and 43 years.

Housewives were the most common socio-professional group with 21 cases (42%), followed by professionals with 18 cases (36%) and civil servants with 7 cases (14%). Baragou *et al.* in Togo in 2014 [9] reported that housewives were the most represented with a frequency of 18.5%. More than half of our patients did not attend school in 26 cases (52%) and only 3 cases (6%) had completed higher education. In their 2009 study in Cameroon, Mboudou *et al.* [15] found 43% with secondary education and 36 with higher education.

More than 1/3 of our patients 17 cases (34%) were pauci parous and 4 cases (8%) were grand multiparous. Diouf *et al.* [16] in 2014 in Senegal reported that 58.1% were primiparous and 22.5% multiparous. Headache, dizziness and oedema of the lower limbs were constant in all cases. Keita [10] in 2015 at Kankan Regional Hospital found 20.66% headache, 20.66% lower limb oedema and 12% vertigo.

Risk factors were dominated by familial hypertension in 19 cases (38%), multiple gestures in 17 cases (34%) and a history of gestational hypertension in 16 cases (32%). Niamkey *et al.* [14] in 2007 in Côte d'Ivoire noted 50% multiple gestational age, 37% multiple gestational age and 31.8% obesity.

**Table 4.** Distribution according to therapeutic data and length of hospitalization.

Medical treatment/hospital stay	Effect if	%
Aldomet 500 mg	37	74
Magnesium sulphate	14	28
Nicardipine 20 mg	13	26
Nicardipine injection	5	10
<b>Length of hospital stay (in hours)</b>		
<24	6	12
24 - 72	6	12
>72	<b>38</b>	<b>76</b>

The gestational age range between 28 and 36 weeks of amenorrhoea was the most represented in 20 cases (40%). Diouf *et al.* [16] in their 2014 study in Senegal reported that 59.7% of patients had a gestational age  $\geq$  37 SA.

Type I hypertension was the most represented 34 cases (68%) and type II 8 cases (16%). In a study carried out by Thiam *et al.* [17] in Senegal in 2009, 47% of patients were found to have pre-eclampsia, 19% had additional hypertension, 17% chronic hypertension and 17% transient hypertension. The results of the biological tests were marked by hyperglycaemia in 7 cases (14%), elevated creatininaemia in 5 cases (10%), viral hepatitis B in 6 cases (12%) and positive retroviral serology in 2 cases (4%).

More than 4/5 of patients had proteinuria in 42 cases (84%), including 14 cases (28%) with 3 crosses, 15 cases (60%) with 2 crosses and 13 cases (26%) with one cross, and it was normal in 8 cases (16%).

Pre-eclampsia was the most frequent maternal complication in 27 cases (54%), followed by eclampsia in 15 cases (30%). Niamkey *et al.* [14] in 2007 in Côte d'Ivoire reported 10.4% eclampsia and 2.6% retroplacental haematoma.

Fetal distress was the most frequent fetal complication in 19 cases (38%), followed by death in utero in 9 cases (18%) and prematurity in 4 cases (8%). This result differs from that of Niamkey *et al.* [14] in 2007 in Côte d'Ivoire, who noted 8.9% stillbirths, 16.5% prematurity and 7.6% fetal hypotrophy.

Medical treatment was dominated by Aldomet 50 mg in 37 cases (74%) and magnesium sulphate in 14 cases (28%). Diouf and Coll [16] in 2014 in Senegal reported that intravenous magnesium sulphate according to the WHO protocol was used in all patients and Nicardipine was administered in 88%.

More than 2/3 (76%) of patients had a length of stay in the department of more than 72 hours, with an average stay of 98.4 hours and extremes of one hour and 168 hours. Keita [10] in 2015 at the Kankan Regional Hospital reported an average length of stay of 6 days, with extremes of 1 and 25 days.

**Limitations:** The limitations of our study include the fact that biological tests are not permanently available at the facility, the lack of resources for performing outpatient tests, and patients' failure to keep appointments.

## 5. Conclusions

Arterial hypertension is common in pregnant women at the CMC les Flamboyants and is still very serious because of its complications. It is more common among poor women with no schooling. Headaches, dizziness and oedema of the lower limbs dominated the reasons for consultation. Type I hypertension was the most common. Pre-eclampsia was the most frequent maternal complication and foetal distress was the most frequent foetal complication.

Medical treatment was dominated by Aldomet 50 mg and magnesium sulphate.

The majority of patients had vaginal deliveries.

Adherence to consultation programmes and proper monitoring of patients by



qualified medical staff would considerably reduce the morbidity and mortality associated with this condition.

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### Authors' Contributions

All authors participated in the data collection, analysis and writing of the manuscript. The final manuscript was read and accepted by all authors.

### Conflicts of Interest

The authors declare no conflict of interest regarding the publication of this article.

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## Appendix

**Inquiry form: N°: .....**

**I-General information:**

1-Age: ..... 2-Occupation: .....; 3-Residence:.....

4-**Marital status:** single.....married .....divorced .....widowed.....

**5-Level of education:**

None..... Primary .....Secondary..... Vocational Higher.....

6-**Mode of admission:** Evacuated .....Directly..... referred .....

7-Date of entry:..... /..... /202.....;

**8-History:**

**Medical history:** HTA..... Diabetes..... HIV .....Tuberculosis.....

Sickle cell disease Other; If other, specify: .....

**Surgical history:** Appendectomy..... Caesarean section Hernia..... Cyst

Other; If other, specify:.....

**Gyneco-obstetrical history:** G: ....; P:.....; VV..... D: .....

**II-Clinical variables:**

- **Number of ANC:** None..... ANC 1-2 ANC 3 ANC and more

- **Quality of ANC:** Good quality..... Poor quality .....

- **Parity:** Nulliparous..... Primiparous ..... Pauciparous ..... Large multipares.....

**Reason for consultation:**

Headache..... Vertigo..... Epigastralgia ..... Epistaxis ..... Dyspnea .....

Palpitation ..... Metrorrhagia ..... Convulsive seizures ..... Oedema .....

Consultation time: ..... Days.....;

**Risk factors for hypertension:**

Primigravida ..... Familial hypertension ..... Nulliparity ..... Multigestites ..... Stress .....

**Obesity History of gestational hypertension** Low socio-economic ..... status .....

Use of oral or injectable contraceptives .....

**Gestational age:**

≤ 20 SA ..... 20 - 27 SA ..... completed 28 - 36 SA ..... completed ≥ to 37 SA

Type of hypertension on admission: Type I ..... Type II ..... Type III ..... Type IV .....

**Maternal complications:**

Pre-eclampsia (toxemia gravidarum) ..... Eclampsia ..... OAP ..... HRP .....

Acute renal failure HELLP syndrome.....

**Fetal complications:**

Prematurity ..... Fetal distress ..... Fetal death in utero ..... Neonatal death .....

Fetal hypotrophy

**Apgar score:** 1st min: ...../10; Good Bad 5th min: ...../10; Good Bad

**IV-Paraclinical examinations:**

Biological:

Platelets.....; PT.....; Glycemia.....;

Blood Group/Rhesus Factor.....; Hematocrits.....;

Blood Urea.....; Creatinemia.....; Urethrocyteuria.....;

Transaminases.....; Bilirubins.....; FO.....;

Bu:.....; Proteinuria:.....; Hematuria:.....; Leukocyturia:.....;

HIV serology.....; HBsAg serology.....;

**Imaging:**

Abdominal ultrasound: Performed Not ..... performed .....

Results: .....

**V-Treatment:**

Medical:

**o Oral:**

- Nifedipine 20 mg cp ..... Aldomet 500 mg cp

**o Injectable route:**

- Magnesium sulphate injection ..... Loxen injection .....

- Catapressan 0.150 mg .....

Other .....

Delivery mode: Low birth ..... Caesarean section .....

**VI-Evolution under treatment:**

**Favorable:** Yes No

**Unfavourable:** Yes No

**Death:** Yes No

Refer to hospital: Yes No

Date of discharge: ..... / ..... /202...;

I-Length of hospital stay: ..... Days;

Referral: Yes No

Reasons for referral: Eclampsia ..... HRP ..... IRA .... HELLP syndrome .....

Other: .....