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Management of Pregnancy-Associated Hypertension at the Kalaban Coro Referral Health Centre, Bamako, Mali

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Abstract: We conducted a descriptive cross-sectional study from JUNE 1 to NOVEMBER 30, a period of six months. Our study included all pregnant women admitted to both wards for hypertension during pregnancy during the study period. Age, occupation, risk factors, history, gestation, parity, laboratory tests, complications, and treatment were studied. Out of 2500 pregnant women admitted, 150 had hypertension during pregnancy, i.e. a prevalence of 6%. The age group between 20 and 30 was the most common with 49%. The pre-eclampsia type is the most common subgroup with 46% and the most dreaded because of its high feto-maternal morbidity and mortality. We recorded maternal complications such as eclampsia and HRP. It is known that poor quality of NPC, late detection of hypertension, low socio-economic level, poor adherence to treatment are factors increasing mortality and feto-maternal morbidity.

Keywords: Pregnancy, Hypertension, Complications, Treatment, eclampsia, mortality

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INTRODUCTION

Pregnancy is a physiological situation of vascular stress with an increase in cardiac output of 30 to 40% and metabolic stress with an increase in basal metabolism of 15 to 30%, allowing harmonious fetal growth. Some women, for multifactorial reasons, will respond abnormally to these pregnancy coping mechanisms. Although pregnancy modifies a woman's physiology, it promotes the development of several diseases and the complication of others, including infections and certain chronic diseases (HYPERTENSION, HF, EPILEPSY, VDT, DIABETES).

Among all these conditions, pregnancy-related hypertension is one of the major causes of fetal, neonatal and maternal morbidity and mortality in Western countries [1]. According to the WHO, hypertension is defined as SBP ≥ 140 mm Hg and DBP ≥ 90 mm Hg [2]**.** It is a pathology of concern for both the obstetrician and the cardiologist. Indeed, according to most authors, it affects 5 to 10% of pregnancies and is the leading cause of perinatal death and the third leading cause of maternal death (9%) after haemorrhage (18%) and pulmonary embolism (11%) [3]. There are several clinical forms during pregnancy, including the proteinuric form called "preeclampsia"; is particularly harmful to the mother and fetus [4]. It is a real public health problem, with great variability in the numbers reported around the world.

The frequency of hypertension during pregnancy is close in most Western countries with a prevalence of 9.3% in France; 10.8% in the United Kingdom; 10 to

15% in the United States; and 10% in Australia in 2008 [5].

On the other hand, in African countries, there is a large difference between frequencies, with rates of 8.9-9.6% in Guinea Conakry in 2000; 17.05 per cent in Niger in 2000; 3% in Dakar; And 8.2% in Tunisia in 2008 and in Cameroon [6, 7].

In Mali, the rates were: 4.91%, in 2012 at the Nianankoro Fomba hospital in Ségou [8], 8.64% in 2010 at the CS ref of commune 6 [8, 9]. Improving the maternal-fetal prognosis therefore requires appropriate management and timely referral. If left untreated, this condition becomes dreadful due to its complications.

OBJECTIVE

The aim was pregnancy-related hypertension in the gynaecology-obstetrics department of the Kalaban-Coro referral health centre (Mali).

MATERIALS AND METHODS

The study was carried out at the Kalaban Coro Referral Health Centre.

Type and Period of Study

This was a descriptive cross-sectional study, which was carried out over a period from 01 June to 30 November 2022; i.e. a duration of 06 months.

Study Population

Our study included all pregnant women admitted to the CS ref of K. Coro during the study period.

Inclusion Criteria

All pregnant infants with systolic blood pressure ≥140 mm Hg and/or diastolic blood pressure ≥ 90 mm Hg.

Non-Inclusion Criteria

Hypertensive pregnant women who were unable to participate in the study or continue the survey. Pregnant patients have not been hospitalized in the ward for other pathologies and with high blood pressure.

Conductof the Study

The Profession

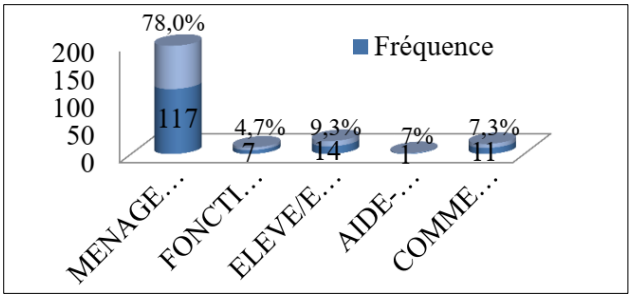

Figure 1: Distribution of pregnant women by occupation

A questionnaire was administered to each pregnant woman included in our study. Thus, certain additional tests were requested: Blood count, urea and serum creatinine (with clearance calculation).

24-hour proteinuria, transaminases and urates, fundus in case of ocular complaint, ECG and echocardiography will be ordered as needed, complete blood count, complete blood ionogram.

Variables

Age, Ethnicity, Occupation, Level of Education, Marital Status, Method of Admission, Risk Factors, Family History, Personal, Obstetric, Gestation, Parity, Different Types of Hypertension, Maternal-Fetal Complications, Evolution, Type of Treatment.

Data Collection

Data were collected from patients through their records, the CPN booklet, the partogram, the admission register and recorded on survey sheets.

Data Processing and Analysis

Data was entered on Microsoft Word and Excel version 2010 and analyzed on SPSS version 23.O. Ethics: All recruited patients were informed of the use of their data for study purposes and their identities were kept confidential.

RESULTS

Frequency

During the study period, we recorded 150 cases of hypertension in pregnancy among 2500 pregnant women admitted, i.e. a frequency of 6%.

Breakdown by Age Group

Table 1: Distribution of patients by age group

Age	Frequency	Percentage (%)
16-19 years old	28	18,7
20 to 30 years	74	49,3
31 to 40 years	45	30
> 40 years old	3	2
Total	150	100

The age group between 20 and 30 years old was the most represented with 49.3%. *Minimum = 16 years Mean age = 29.08 ± 6.72 years Maximum = 44 years.

The data reported in the figure prove that the household occupation was the most represented with 78%.

Educational Attainment

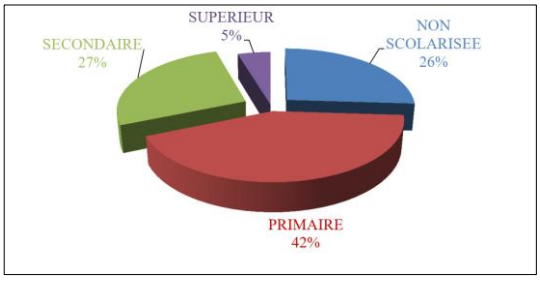

Fig-2: Distribution of pregnant women according to

level of education

Primary education was the most represented with a rate of 42 per cent.

The Type of Admission

Table 2: Distribution of Pregnant Infants by Mode of Admission

Method of admission	Frequency	Percentage (%)
Evacuated	64	42,7
Referred to	23	15,3
Coming of its own accord	63	42
Total	150	100

Only 1/3 of the patients came on their own. Most admissions for hypertension during pregnancy were in an emergency setting with a rate of 42.7%.

Risk Factors for Hypertension

Table 3: Distribution of pregnancies by risk factors

Risk Factors	Frequency	Percentage (%)
Contraception	100	66,7
Sedentary lifestyle	10	6,7
Obesity	1	0,7
Diabetes	5	3,3
Multiparity	34	22,7
Total	150	100

Contraception was the most represented with 66.7%. On the other hand, no factors were found in some of them.

Background Studies

Family and personal history were hypertension and diabetes. Also, an obstetric history of hypertension, HRP and eclampsia increases the risk of developing hypertension during pregnancy by 20%, 18.75% and 4% respectively. These data are reported in the following table:

Table 4: Distribution of pregnant women by family history, medical personnel and obstetrics

Family history	Frequency	Percentage (%)
HTA	65	43,3
Diabetes	30	20
Sickle-cell anemia	2	1,3
None	53	35,3
Personal medical history		
HTA	31	20,7
Diabetes	10	6,7
Heart	5	3,3
Nephropathy	1	0,67
None	103	68,7
Obstetric history		
HTA	30	20
HRP	28	18,7
Eclampsia	6	4
MFIU	4	2,7
Other	82	54,7

Family and personal history were hypertension and diabetes.

Gestation

Table 5: Distribution of pregnant women by gestation

Gesture	Frequency	Percentage (%)
Primigestes	50	33,3
Pauci gesture	35	23,3
Multi Gesture	26	17,3
Great multi gesture	39	26
Total	150	100

The frequency of primigestes and large multi-gestures were much higher at 33.3% and 26% respectively.

Parity

Table 6: Distribution of pregnant women by parity

Parity	Frequency	Percentage (%)
Nulliparous	52	34,7
Primiparus	17	11,3
Pauci paré	29	19,3
Multiparous	33	22
Large multiparous	19	12,7
Total	150	100

The frequency of hypertension was higher in nulliparous and multiparous women with 34% and 22%, respectively.

There is a difference between these results and those of gestation. And this could be explained by the fact that some pregnant women were registered in the department but delivered at the University Hospital. In addition, the number of pregnancies is not equal to the number of deliveries.

RESULTS OF THE BIOLOGICAL ASSESSMENT

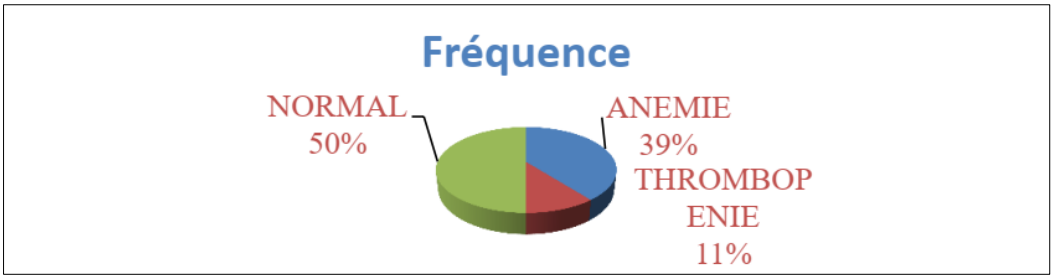

Figure 3: Distribution of pregnant women according to the result of the blood count.

Anemia was the most represented anomaly with 39%. Anemia and thrombocytopenia are the two main abnormalities found on the blood count in preeclampsia.

Distribution of Proteinuria in the Dipstick:

Table 7: Distribution of pregnancies by dipstick proteinuria outcome

Urine dipstick	Frequency	Percentage (%)
Absent	29	19,3
A cross	34	22,7
Two crosses	42	28
Three or more crosses	45	30
Total	150	100

Dipstick proteinuria was 3 crosses in 30% of cases and 2 crosses in 28%.

Blood Pressure Figures

Table 8: Distribution of pregnant women according to the severity of hypertension

Severity of hypertension	Staff	Percentage (%)
Mild to moderate hypertension	107	71,3
Severe hypertension	43	28,7
Total	150	100

Mild to moderate hypertension was the most represented class, at 71.3%.

Type of Hypertension

Table 9: Distribution of pregnant women according to the different types of hypertension

Type of HTA	Frequency	Percentage (%)
Pre-eclampsia	69	46
Gestational hypertension	54	36
Chronic hypertension	19	12,7
Pre eclampsia on added	8	5,3
Total	150	100

Preeclampsia was the most represented with 46%.

Method of Treatment

Table 10: Distribution of patients by mode of treatment

TREATMENT	Frequency	Percentage (%)
Monotherapy	100	66,7
Dual Therapy	48	32
Triple Therapy	2	1,3
Total	150	100

We performed monotherapy, dual therapy, triple therapy in 66.7%, 32% and 1.3% respectively. Most pregnant women were put on monotherapy and dual therapy.

Table 11: Patient Treatments by Monotherapy

Antihypertensive Classes	Frequency	Percentage (%)
Calcium channel blockers	57	57
Central antihypertensive drugs	43	43
Total	100	100

Amlodipine was the calcium channel blocker of choice and methyldopa the most widely used central antihypertensive drug.

Table 12: Treatment according to dual and triple therapy

Antihypertensive Classes	Frequency	Percentage (%)
IC+CENTRAL	44	88
IC+BB	4	8
IC+BB+CENTRAL	2	4
Total	50	100

Amlodipine and methyldopa were given in combination with dual therapy. Triple therapy has been used in severe forms.

Complications

Maternal Complications

Table 13: Distribution of patients by complications

Maternal complications	Frequency	Percentage (%)
FAVORABLE	81	54
ECLAMPSIA	21	14
RESISTANT HTA	20	13,3
DEATH	4	2,7
HELLP SYNDROME	3	2
IRA	1	7
HRP	20	13,3
Total	150	100

The trend was favourable in 54%. The main complications were eclampsia and HRP in 14% and 13.3% respectively.

Fetal Complications

Table 14: Distribution of patients by fetal complications

FETAL COMPLICATIONS	Frequency	Percentage (%)
In-utero growth restriction	11	7,3
Fetal death in utero	16	10,7
Early mowing	14	9,3
Acute fetal distress	22	14,7
Absence of complications	89	59,3
Total	150	100

The most common fetal complications were MFIU in the context of HRP (10.7%), early miscarriage (9.3%) and SFA (14.7%). The prognosis was favorable in 59.3%.

Distribution of Patients who Underwent Echocardiography

Table 15: Distribution by cardiac Doppler ultrasound results

Cardiac Doppler Echo	Frequency	Percentage (%)
NORMAL	120	80
HVG	5	3,3
LVEF<45%	8	5,3
NOT DONE	17	11,3
Total	150	100

The abnormalities were **LVH** with 3.33% and **CMP-PP** with **5.33** with **LVEF** <45%.

Obstetric Ultrasound

Table 16: Distribution of patients by obstetric ultrasound results

Obstetric ultrasound	Frequency	Percentage (%)
Normal	102	68
Abnormal	48	32
Total	150	100

Obstetric ultrasound was normal in 68% with Manning score retained.

DISCUSSION

Our study concerned all pregnant women admitted to the CS ref of Kalaban Coro during the study period. Included were all pregnant infants with SBP≥140mm Hg and/or DBP≤ 90mm Hg.

Frequency

The study was conducted from June 1 to November 30, 2022; i.e. a period of six months. During this period, we recorded 150 cases of hypertension in pregnancy among 2500 patients admitted, i.e. a frequency of 6%. The frequency of the association between hypertension and pregnancy varies between the authors, and depends on the inclusion criteria in the different series. Our rate is higher than Dao's[3] which found 3.65% and lower than that of Kembou [5]. 16,5%.

Socio-Demographic Characteristics

Age The average age of our study was 29.08 years±6.72 years for Diallo [10]. 30 years old and Fomba [8]. 28.3 years. The extreme ages were 16 and 44 years, close to those of Dao [3], who recorded 14 and 44 years. The 20-30 age group predominated with a rate of 49%; this value is close to that of Pambo [11], with 55%. In the Dao Study [3], the most represented was the 20-34 age group, i.e. 63.4%. This high frequency of pregnancies at a young age could be explained by the lack of means necessary for the proper monitoring of pregnancy. In our study, the rate of Married were 97.3%. This result is similar to that of Dao [3], and Fomba [8], with rates of 85.8% and 88% respectively. Rather, marital status would play a role in monitoring pregnancy. Indeed, a single woman theoretically has more difficulty in having her pregnancy monitored than a married woman, she is then exposed to pathologies such as hypertension, thus compromising the maternal and/or foetal prognosis. The Profession housewife was the most frequent with 78%, this rate is higher than that of Diakité [12], which found 68.3%. This is a socio-professional category.

Risk Factors

There are many of them, the use of contraception was the most frequently encountered with 41.3%. These observations are similar to that of Fomba, which found 37.7% of estrogen-progestin, and higher than that of Dao, which reported 25% of estrogen-progestin.

Background

Family and personal history of hypertension predominated with 43.33% and 20.7% respectively. Indeed, when one of the parents is hypertensive, the risk in children is significant but the mode of transmission is discussed. This observation is in agreement with Beaufils' observation [13], who noted that lifestyle and family history predisposed to the onset of hypertension.

Gestation-Parity

Primetry and multi-gesture with 33.3% and 26% respectively predominated in the study. Preeclampsia was much more common in primingestrians. These facts have also been reported in the literature. The lack of exposure to the partner's sperm, the family predisposition, the compression of the vessels by the gravid uterus could explain this predominance in primingeges. Nulliparous women with 34.7% and multiparous women with 22% were the most numerous, mainly patients with preeclampsia. The predominance of this pathology in nulliparous was also noted by Dao [3], and Fomba [8]. Parity would therefore be a risk factor for the occurrence of preeclampsia, which is more common in nulliparous women, unlike chronic hypertension, which is the prerogative of multiparity.

Paraclinical Data

Dipstick proteinuria was significant in 58% of patients distributed between 2 and 3 or more crosses. Anemia was present in 39%. Our results are in agreement with those of DAO [3], and Fomba [9], who noted the predominance of renal abnormalities. LVH and CMP-PP were found on echocardiography and obstetric ultrasound was normal in 68% of cases.

Treatment

The management of the patients consisted of preventive treatment, curative treatment and obstetric treatment. Medical treatment was administered either orally (in moderate hypertension) or parenterally (in severe hypertension). Monotherapy was instituted in 67.3%; Fisher [8], had a rate of 50.6%. Dual therapy was used in 32%, this rate is close to that of Diallo who regained 35%. Triple therapy was used in 7%, this rate is lower than that of Traoré who had 10.74%. This could be explained by the study locations or the context in which the patients were referred. Alpha methyldopa or amlodipine for mild and moderate forms. Nicardipine for severe parenteral forms in combination with alpha methyldopa and/or beta-blockers.

Maternal Complications

Morbidity

Eclampsia was observed in 14% of our patients. This rate is lower than that of Dao [3], which reported 19.2% and that of Beaufils 0.56%. Retroplacental hematoma accounted for 13.3% of cases, but in the FOMBA study, HRP was 1.2%.

Mortality

In our study we recorded 2.7% of maternal deaths close to the rates of Fomba [14], which obtained 2.4% and Dao [3] 3.3% of mortality cases. The circumstances of occurrence were generally OAP and HELLP syndrome.

Fetal Complications

Many studies carried out in Mali agree on the poor fetal and neonatal prognosis in the case of a combination of hypertension and pregnancy. Regarding the MFIU, our series observed a rate of 10.7% lower than that of Fomba [8], with a rate of 20% but superimposed on that of DIALLO [14], with a rate of 10.9%.

CONCLUSION

Pregnancy-associated hypertension has been frequently encountered in pregnant women hospitalized at the CS Ref of Kalaban Coro. Clinical forms were preeclampsia, gestational hypertension, chronic hypertension and superadded preeclampsia. Poor quality of antenatal follow-up, late detection of hypertension, low socio-economic level, poor adherence to treatment were factors increasing maternal-fetal mortality and morbidity. Despite a better understanding of the pathophysiology of hypertension during pregnancy, its treatment remains the evacuation of the uterine cavity. However, this attitude can be delayed depending on the term of the pregnancy. This is a high-risk pregnancy requiring multidisciplinary care (cardiologist, obstetrician-gynaecologist, pediatrician, anaesthetist-intensive care specialist).

Conflict of Interest: None.

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