

Research Article

# Epidemiological and Cardiovascular Prognostic Profile of Pediatric Arterial Hypertension at the Hospital National Ignace Deen de Conakry (Guinea)

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## Abstract

**Introduction:** The prevalence of hypertension in children is much lower, around 1 to 5%. Clinical signs are still marked by accidents revealing neurological, cardiac and renal damage. The aim was to determine the epidemiological profile and prognosis of pediatric hypertension at the Ignace Deen National Hospital. **Materials and methods:** This was a prospective descriptive study of children and adolescents admitted to the pediatric ward of the Ignace Deen National Hospital during the period March 1 to August 31, 2021. All those aged 1 to 15 years declared hypertensive with mean systolic or diastolic blood pressure  $\geq$  95th percentile were included in this study. **Results:** Out of a total of 464 patients, our study included 12 cases, representing a 2.52% incidence of arterial hypertension; the mean age of our patients was 8 years  $\pm$  2 years; males predominated, with a sex ratio equal to 2; physical signs were marked by edema of the lower limbs (66.67%); Immediately threatening hypertension represented 41.67%; hypertensive retinopathy was found in 33.33% of patients; 16.67% of patients presented with LVH; 25%; renal complications were 25%; mortality was of the same order 25%. **Conclusion:** The complications of pediatric hypertension are a real public health problem, with a high morbidity and mortality rate.

## Keywords

Pediatric Hypertension, Prognosis, Conakry

## 1. Introduction

Hypertension in children and adolescents is defined by a mean systolic and/or diastolic BP greater than or equal to the 95th percentile according to sex, age and height, measured on three different occasions. A BP between the 90th and 95th

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percentiles is considered pre-hypertensive [1]. Borderline hypertension is defined as systolic and diastolic values between 97.5th percentile and 97.5th percentile + 10 mmHg, Confirmed hypertension as systolic and diastolic values between 97.5th percentile + 10 mmHg and 97.5th percentile + 30 mmHg, Threatening hypertension as systolic and diastolic values above 97.5th percentile + 30 mmHg [1].

Pediatric hypertension is a major public health problem, affecting around 20% of adults worldwide. Its prevalence in children is much lower, at around 1 to 5%. Clinical signs are still marked by accidents revealing neurological, cardiac and renal damage [2, 3].

Reliable estimates of hypertension in children are rare, but studies have shown that childhood hypertension has increased over the last decade due to the rise in childhood obesity. One systematic review estimated that the global prevalence of childhood hypertension in 2015 ranged from 4.3% in 6-year-olds to 3.2% in 19-year-olds, and peaked at 7.9% in 14-year-olds [4].

In follow-up studies, 15% to 40% of hypertensive children remain hypertensive into adulthood [5].

High blood pressure is one of the most important risk factors for coronary heart disease, chronic heart failure, peripheral perfusion disorders, and the onset and/or progression of chronic renal failure [6].

The aim of our study was to determine the epidemiological profile and prognosis of pediatric hypertension at the Ignace Deen National Hospital.

## 2. Methodology

This was a prospective descriptive study of all children and adolescents admitted to the pediatric ward of the Ignace Deen National Hospital in Conakry during the period from March 1<sup>er</sup> to August 31 2021.

All those aged 1 to 15 years declared hypertensive with mean systolic or diastolic blood pressure  $\geq$  95th percentile were included in this study.

The IDA automatic blood pressure monitor with three types of cuff: 13 - 20 cm, 20 - 28 cm and 22 - 32 cm was used to measure blood pressure: The size of the cuff was chosen according to the length of the child's arm (the optimum width covering more than 2/3 of the arm's length), with the child in the supine position for at least 5 min after emptying the bladder; three (3) successive measurements were taken at 3 min intervals on the two (2) arms, with the highest value considered, then the average of the three (03) measurements was taken and adapted to the formula defining the limits of BP (percentile 95mmHg). The measurement was taken by a nurse not wearing a white coat, and the child was placed in a calm, non-agitated environment. The values obtained were represented by a paediatrician on the percentile sheet. Hypertension was classified as: borderline hypertension, with systolic and diastolic values between 97.5th percentile and 97.5th percentile + 10 mmHg; confirmed hypertension, with systolic and

diastolic values between 97.5th percentile + 10 mmHg and 97.5th percentile + 30 mmHg; threatening hypertension, with systolic and diastolic values above 97.5th percentile + 30 mmHg.

## 3. Results

During the study period, we recorded 12 cases of arterial hypertension, representing a frequency of 2.58% (Figure 1).

The mean age was  $8 \pm 2$  years, with extremes ranging from 1 to 15 years (Table 1).

The sex ratio was 2.04, with males predominating (Figure 2).

Hypertension and familial diabetes were the most common risk factors (Table 2).

Threatening hypertension accounted for 33.33% (Figure 3).

Coronary syndrome characterized by the presence of a negative T wave on the ECG was found in 25% of cases (Figure 4).

Neurological and cardiac damage were the most common complications, accounting for 33.33% of all cases (Table 3).

Mortality in our series was 16.67% (Figure 5).

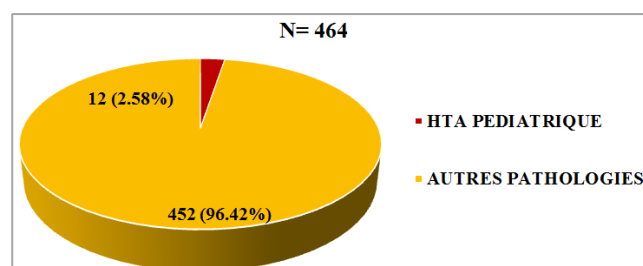


Figure 1. Frequency of pediatric hypertension.

Table 1. Distribution of hypertensive children by age group.

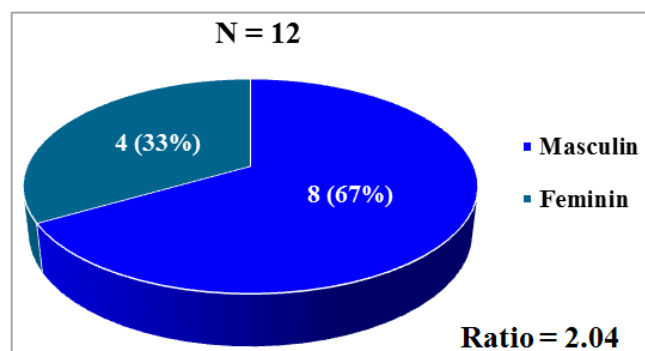
Age group (Year)	Workforce	Percentage
1 – 5	1	8,33
6 – 10	6	50
11 – 15	5	41,67
TOTAL	12	100

Average age:  $8 \pm 2$  years Extreme age: 1 to 15 years

Table 2. Distribution of hypertensive children according to risk factors.

Risk Factors	Workforce	Percentage
Familial AH	5	41,67

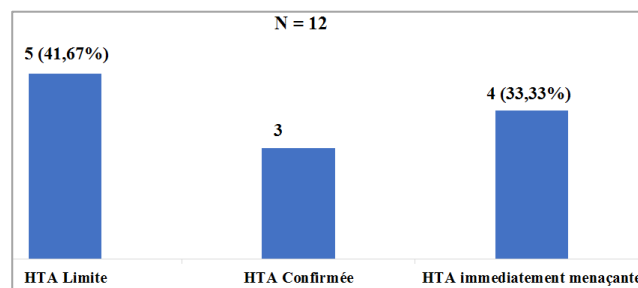
Risk Factors	Workforce	Percentage
Familial diabetes	4	33,33
Recurrent tonsillitis	3	25
Family Obesity	2	16,67
Pyoderma	1	8,33



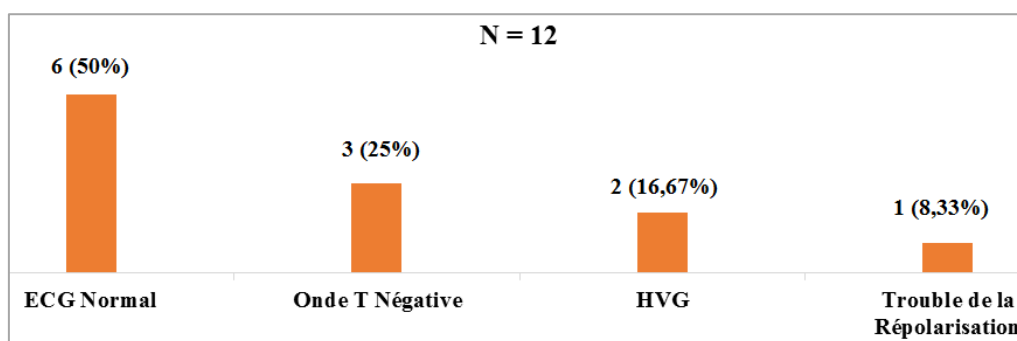
**Figure 2.** Distribution of hypertensive children by sex.

**Table 3.** Distribution of hypertensive children according to visceral complications of hypertension.

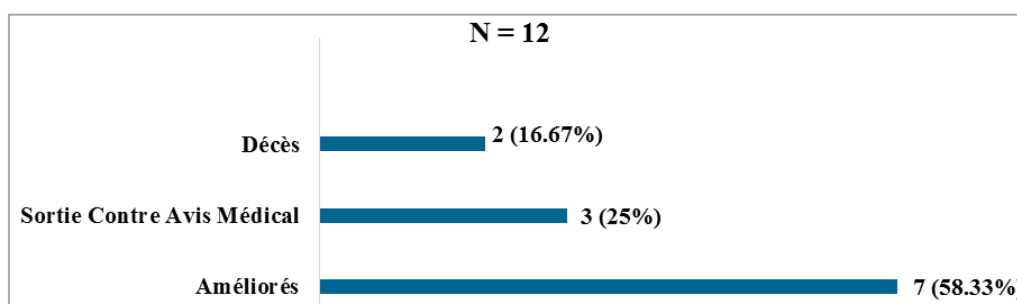
Visceral complications	Workforce	Percentages
Neurological	4	33,33
Cardiac	4	33,33
Renal	3	25
Eyepieces	2	16,67



**Figure 3.** Distribution of hypertensive children by type of hypertension.



**Figure 4.** Distribution of hypertensive children according to ECG results.



**Figure 5.** Distribution of children with hypertension, by stage of development.

## 4. Discussion

It was difficult for us to identify the real epidemiological characteristics of pediatric hypertension, because in most pediatric wards, blood pressure measurement is not systematic due to a lack of working tools.

In this series, out of a total of 464 children observed, 12 were hypertensive. Our frequency is comparable to the worldwide incidence of childhood hypertension in 2015, which was estimated at between 3.2% and 4%; in the USA, it ranged from 2.2% to 4% [6].

Reliable estimates of hypertension in children are rare, but studies have shown that hypertension in children has increased over the last decade due to the rise in childhood obesity [6].

The 6 to 10 age group accounted for half of the population, with an average age of  $8 \pm 2$  years and extremes of 1 to 15 years. D'ésir éde la Nation reported a frequency of 52.99% for the same age group [7].

MCNIECE et al have reported that 15% to 40% of hypertensive children remain hypertensive into adulthood [8].

More than half of our patients were male, with a sex ratio of 2.04; KABA ML et al. in Guinea 2006 reported a predominance of females, with a sex ratio of 1/3 [9]; paediatric blood pressure standards vary according to the age, sex and size of the child [10].

The main risk factors were a family history of hypertension (41.67%); familial diabetes (1/3 of cases); recurrent tonsillitis (1/4 of cases); familial obesity (16.67%); MCNIECE et al. reported that the incidence of hypertension increased with BMI, and that overweight was the only independent risk factor in their series [8].

In this study, 1/3 of patients had threatening hypertension; 1/4 of patients had confirmed hypertension and 41.67% had borderline hypertension. The visceral complications observed in our series were largely caused by threatening arterial hypertension; cardiac complications and neurological complications 1/3 of cases each; renal complications 1/4 of patients and ocular complications 1/6 of patients.

High blood pressure increases the risk of early complications such as ventricular hypertrophy and carotid intima-media thickening [10]; in our series, we found 16.67% left ventricular hypertrophy, 8.33% repolarization disorder and 25% cardiac ischemia on ECG. Studies have shown that the incidence of ventricular arrhythmias increases with the presence of LVH and ischemia, and that the risk of sudden death increases threefold in hypertensive patients [11]. Daniels et al. reported in their study that the majority of hypertensive children had at least unilateral hypertensive retinopathy [12].

Mortality in this study was 16.67%, of cases related to severe renal failure not treated by an extra-renal purification technique.

## 5. Conclusion

Hypertension in children is a major cardiovascular risk factor;

its diagnosis is relatively difficult due to the lack of regular blood pressure monitoring in our clinical practice. It is often discovered in conjunction with complications, and regular measurement of blood pressure in children at each consultation can help prevent the onset of visceral complications.

## 6. Recommendation

Request to carry out much broader Study by creating computerized medical records for all health structures in the country.

Request for systematic measurement of blood pressure in all children and adolescents admitted to the Hospital.

## Abbreviations

ECG	Electrocardiogram
HVG	Left Ventricular Hypertrophy
HTA	Arterial Hypertension
BMI	Body Mass Index
IDA	International Directorate of Accreditation
mmHg	Millimeter of Mercury
BP	Blood Pressure
USA	United State of America

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## Declaration of Informed Consent

All authors appearing in this article equally share and agree to the publication of this article in your journal.

## Conflicts of Interest

The authors declare no conflicts of interest.

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