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Hypertension (Htn) among Young People of 18 to 35 Years Old in Cardiology Department of Gabriel Toure University Teaching Hospital

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Abstract

Few studies have been conducted on hypertension among youth in Mali hence the interest of our study aimed to clarify certain aspects what are not taken account yet in previous studies. **Objective**: Determine the clinical and para-clinical characteristics of hypertension among 18 to 35 years old young people. **Methods:** This cross-sectional and retrospective study of 24 months from January 1st, 2009 to December 31st, 2010 in the cardiology department of the Gabriel Touré UTH. **Results:** We identified 132 cases during the study period out of 2146 cases of hypertension with a prevalence of 6.1%. The female gender represented 81.8%, with a sex ratio of 45.59, 1% of patients had an unknown family history of hypertension. The age group of 31 to 35 years accounted for 43.9%. The circumstances of discovery were dominated by exertional dyspnea (37.9%). Body mass index was normal in 45.5% of patients. The higher BMI was more common in female patients with 39.39% (p = 0.045). In the sample, 53% of patients had a systolic blood pressure between 140 and 159 mmHg and 38.6% had diastolic blood pressure ≥ 110 mmHg with no significant difference (p > 0.5). The high creatinine level was found in 18.18% of our patients. The ECG found 84.6% of left ventricular hypertrophy among cavitary hypertrophies. The echocardiography has found cavitary dilatation in 40.04% of cases; it concerned the left ventricle in 25.71%. Also 18.57% of our patients had impaired left ventricular systolic function. Among the complications found in our patients, kidney failure led with 56%. **Conclusion:** Hypertension is not a rare event among young population even with a normal body mass index. It is often discovered during complications that can be dreadful.

Keywords

Hypertension, Young People, Complications

1. Introduction

Cardiovascular diseases still represent a major cause of morbidity and mortality. Young people are less likely than older people to believe that they have high blood pressure and then less likely to return to their doctor. Often, these are patients whose blood pressure would respond to weight loss and lifestyle changes, but they are less enthusiastic to seek treatment [1] [2].

In the world, many studies have concerned hypertension both in the elderly and in young adults. Thus we may note a prevalence of 12% in young medical students with an average age of 21 years in Argentina [3]. In Africa, the prevalence is generally higher in the adult population, 23% in South Africa, 15% in Cameroon, 31.1% in Tanzania and 31.4% in Zimbabwe [4].

This prevalence in West Africa in an adult population is estimated at 40% by some authors [5].

In Mali, estimates range from 16.6% to 45% [6] [7] [8]. However few studies have involved young people. We have initiated this study to identify clinical and complementary aspects of hypertension in the population from 18 to 35 years old in cardiology outpatient.

2. Method

The study was performed in the cardiology department of the Gabriel Touré UTH. This hospital because of its geographical location, is still the most visited hospital and is located in the administrative center of the city of Bamako.

This was a cross-sectional and retrospective study of 24 months from January 1st, 2009 to December 31st, 2010, over cardiology outpatients. The sample was composed of all patients during the study period who met these following inclusion criteria: Patients whose age was between 18 and 35 years, who agreed to participate in the study; in whom the diagnosis of hypertension was done after consultation and who carried out the first check-up including glucose blood test and creatinine blood test. The electrocardiogram and Doppler echocardiography were often made.

Hypertension was defined as blood pressure ≥ 140/90 mmHg.

Cardiac involvement was estimated by electrocardiogram and Doppler echocardiography.

The creatinine clearance was calculated using the formula of Cockroft and Gault:

$$\left[(140-\text{age})\times \text{weight}/\text{creatinine: mmol/L}\right]\times k$$

(k = 1.23 for men, k = 1.04 for women). It allowed us to evaluate the renal impact of hypertension.

RF stage	Description	GFR
G1	Up and optimal	>105 90 - 104
G2	Medium	75 - 89 60 - 74
G3a	Medium to moderate	45 - 59
G3b	Moderate to severe	30 - 44
G4	Severe	15 - 29
G5	ERF	<15

RF: Renal failure GFR: Glomerular filtration rate G: Grade ERF: End stage renal failure.

The body mass index was calculated using the following formula: BMI = weight/ height squared. Overweight was defined as BMI ≥ 25%.

The diagnosis of stroke was made from the clinical examination and CT scan.

A survey questionnaire was developed for each patient. Data entry and analysis were performed on Microsoft WORD 2007 and SPSS 18.

3. Results

We recorded 132 cases of hypertension among 18 - 35 years old young people out of 2146 cases of hypertention with a frequency of 6.1%. Patients whose age was between 31 and 35 years accounted for the majority, with 43.9% (Table 1). The females represented 81.8% with a sex ratio of 4.5 (Table 2).

Overweight was found in 48.5% of patients according to body mass index. The high BMI was more common in female patients with 39.39% (p = 0.045). Hypertension was the main cardiovascular risk factor in our study with 39.4% followed by obesity with 20.4% and contraception with 15.2% (Table 3). Hypertension represented the most frequent personal history with 47.7%. More than half of our patients had an unknown family history with 59.1%. The circumstances of discovery were dominated by dyspnea with 37.9% (Table 4). In our sample, 53% of our patients had a systolic blood pressure between 140 and 159 mmHg and 38.6% had a diastolic blood pressure ≥ 110 mmHg.

The standard electrocardiogram was performed in 103 of our patients with a rate of 78%. The most frequent abnormality was left ventricular hypertrophy with 84.6%. Doppler echocardiography was performed in 70 patients (53%). It showed an alteration of the left ventricular systolic function in 18.57% of cases, and a dilatation of the same cavity in 25.71% of cases.

122 patients in the sample had performed a fasting glycaemia test and hyperglycemia was observed in 28.03%. The creatinine clearance was abnormal in 31 of our patients by 23.5%. Severe to end stage chronic renal failure was observed in 3.8% of our patients (creatinine clearance less than 30 mL/min). Among the complications found In 56 patients, the most frequent complication was the chronic renal failure (56%) followed by heart failure (30%) and stroke (5%) (Table 5 and Table 6).

Table 1. Distribution of patients according to age.

Age groups	Numbers	Frequencies
18 - 20 years	11	8.4
21 - 25 years	18	13.6
26 - 30 years	45	34.1
31 - 35 years	58	43.9
Total	132	100.0

Patients whose age is between 31 and 35 years make up the majority with 43.9%.

Table 2. Distribution of patients according to gender.

Gender	Numbers	Frequencies
Male	24	18.2
Female	108	81.8
Total	132	100.0

Women accounted for 81.8%, with a sex ratio of 4.5.

Table 3. Distribution of patients according to their cardiovascular risk factors.

Risk factors	Numbers	Frequencies
Tobacco	3	2.3
Obesity	27	20.4
Hypertension	52	39.4
Diabetes	3	2.3
Sedentarity	10	7.6
Metabolic disorders	10	7.6
Stress	7	5.3
Unknown	4	3.0
Contraception	20	15.2
Corticosteroids	1	0.8

Hypertension was the main cardiovascular risk factor in our study with 39.4% followed by obesity with 20.4%.

Table 4. Distribution of patients according to the circumstances of discovery.

Circumstances of discovery	Numbers	Frequencies
Fortuitous	26	19.7
Exertional dyspnea	50	37.9
Palpitations	36	27.3
Chest pain	21	15.9
Syncope	1	0.8
Lipothymia	1	0.8
Hydrops	1	0.8
Congestive heart failure	1	0.8
Nephropathy	5	3.8
Pregnancy	15	11.4

The circumstances of discovery were dominated by dyspnea with 37.9%.

Table 5. Distribution of patients according to the complications.

Complications	Numbers	Frequencies
Chronic renal failure	31	56
Heart failure	17	30
Stroke	3	5
Retinopathy	3	5
Pre-eclampsia	1	2
Angina	1	2
Total	56	100

In a total number of 56 patients showing complications the chronic renal failure led with 56%.

Table 6. Distribution of patients according to creatinine clearance.

Creatinine clearance (ml/min)	Numbers	Frequencies
Advanced chronic renal failure (10 - 15)	3	2.3
Severe chronic renal failure (15 - 30)	2	1.5
Moderate chronic renal failure (30 - 60)	4	3.0
Mild chronic renal failure (60 - 100)	22	16.7
Normal Renal function (>100)	101	76.5
Total	132	100

The creatinine clearance was abnormal for 31 of our patients (23.5%).

4. Discussion

We found a hypertension frequency of 6.1% for 18 - 35 years age group and the age group between 31 and 35 years was mostly represented with 43.9%. This result was close to 48.3% of Longo [9] for the 25 - 34 age group over a study on hypertension in Brazzaville.

Females predominated with 81.8% and the sex ratio was 4.5. This result goes with the one of Diallo [7] (65%), but in contrast with the one of Baragou [10] that reported male predominance (55%). This difference could be explained by the fact that these authors are interested in severe and malignant hypertension in particular.

Being overweight is a risk factor consistently given by the authors [2] [3] [4] [7] [9] [10]. It was associated with 48.5% of patients with hypertension and represented 20.4% of risk factors. There was also a female predominance with 39.39% (p = 0.045). This was reported by many authors, especially in black people living on the African continent or outside [2] [4] [7] [10] [11]. Some authors explain the female predominance by the impact of sociocultural factors on the one hand and on the other hand by the precarious living conditions of those living harsh lifestyle [2] [4].

Other cardiovascular risk factors were hypertension (39.4%) and contraception (15.2%). This high proportion of contraception, well above the 0.91% reported by Goeh Akue [12] in a Togolese series could be partly explained by the

high incidence of women and their urban residence. Indeed, women accounted for 81.8% of the sample while they accounted for only 55.05% with a rural residence from the same author.

In the series 59.1% of patients did not know their family history. Goeh Akue [12] reported a family history rate of 7.34% and 45% from Diallo [7] in another study in Mali. 47.7% of patients recognized themselves as hypertensive before their care in cardiology, which result is below the 71% found by Kaba [13] and 68% from Baragou [10]. Another author [12] found a fortuitous discovery (52.75%).

The circumstances of discovery were dominated by dyspnea with 37.9%. This result is close to the 35.32% from Goeh Akue [12], higher than 13.45% from Baragou [10]. In the series 38.6% of patients had a diastolic blood pressure stage II of the JNCVII. This rate is lower than 73.4% [12] and 100% [10] from some Togolese authors, and in accordance with 45.53% of Dembele [14].

Left ventricular hypertrophy on electrocardiogram was found in 84.6% of patients this rate is in disagreement with some authors [10] (21.76%) [15] (24%) and [4] (50%). In addition heart failure with decreased systolic function was observed in 18.57%, which is consistent with the 16% from some African series [4]. This is also consistent with the 19.75% from Dembélé [14].

28.03% of patients have shown hyperglycemia which is higher than 6.47% [10] 2.13% [13] and 16.7% in internal medicine [14].

Chronic renal failure was noted in 23.5% of patients. This rate was 34% in a similar study in cardiology in Conakry [15] and 6.17% in internal medicine in Bamako [14]. This could be explained by a higher frequency of this kind of population as indicated by [2]. Some authors raise the issue of kidney as a victim or cause for hypertension [2] [15]. It seems that kidney disorders are the most common causes of hypertension in this population [2].

Beside renal failure 56% (with an end stage portion to 3.8%), there were the heart failure (30%) and stroke (5%). These rates are consistent with the 55% of renal damage from Kaba [13], higher than 6.17% of renal failure and 19.75% of heart failure from Dembele [14]. Dembele has found a higher rate of stroke (12.34%). This difference could be explained by the older age of these patients and also their confirmed diabetic status.

5. The Limitations of the Study

Our study has some limitations: the sample size (132 cases), no information on the fate of some of our patients with severe renal failure and also the absence of extensive investigations in these patients. All these difficulties seem to be related to the retrospective nature of the study on the one hand and on the other hand, the often high cost of these tests.

6. Conclusion

This study of 132 young people from 18 to 35 years old shows a very high frequency of hypertension and also a very high frequency of serious complications

(kidney and heart failure, and stroke) in this very young population. This raises the problem of adequate care for young hypertensive in specialized centers. This health care reveals the issue of adherence and greater vigilance on screening for renal failure which is characterized by an early occurrence and rapid progression in this population.

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