

Prevalence and Contributing Factors of Orthostatic Hypotension in the Cardiology Department of the CHU Ignace Deen in Conakry

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Abstract

Introduction: Orthostatic Hypotension (OH) is a frequent situation during consultation in hypertensive patients. The prevalence in the general population increases with age and it is recommended to systematically search for it in patients with multiple comorbidities. The objective of this study was to determine the prevalence of orthostatic hypotension; describe their socio-demographic profile, the various clinical and paraclinical aspects and the predisposing factors of orthostatic hypotension in treated hypertensives, controlled or not. **Method:** This was a descriptive cross-sectional study, from January 2 to June 30, 2022 in the cardiology department of the Ignace Deen National Hospital. Included in this study were all patients who presented with orthostatic hypotension under antihypertensive treatment, regardless of age and sex, and who agreed to participate in the study. The non-inclusion criteria were hypertensive patients without OH and those who had not agreed to participate in the study. Each patient had blood pressure and heart rate measured in the supine position at room temperature and with an empty bladder. Then the measurement is taken again three (3) minutes after the switch to orthostatism. We retained the diagnosis of OH if the SBP drops by at least 20 mmHg and/or the PAD by at least 10 mmHg three (3) min after the transition to orthostatism. Our data obtained were analyzed in the Epi-info 7.4.0 software. **Results:** During our study period, we investigated 385 presented with OH, 12.2%. The mean age of the patients was 60.83 years \pm 10.01 years and hypertensive patients, 47 of whom the M/F sex ratio was 0.81. In our study, blood pressure was not controlled in 36.2% of our patients with a predominance of grade 3 hypertension, a rate of 55.32%. Renal failure, anemia, heart failure and stroke were the main comorbidities associated with

the occurrence of HO. The most incriminated factors were age with a frequency of 74.47%, followed by obesity at 44.68% and diabetes at 27.66%. BP was normally controlled with a rate of 68.8% in treated hypertensive patients with OH. It is found much more in patients using triple therapy, a rate of 61.71%. **Conclusion:** The prevalence of OH is high in our department. It is found much more in patients using triple therapy. The most incriminated factors were age followed by obesity and diabetes.

Keywords

Orthostatic Hypotension, Contributing Factors, Conakry

1. Introduction

Arterial hypotension is noted in 0.4% of hospitalized patients of all ages. Its prevalence in the general population increases with age, reaching 5% to 30% over the age of 65, particularly in hypertensive and/or institutionalized subjects [1]. It is recommended to systematically search for hypertensives, people aged over 65, patients taking antihypertensive drugs, diabetic patients, patients with kidney failure or with Parkinson's disease, subjects with cognitive disorders, malnourished patients and dehydrated [2].

While OH is common and impacts patient safety and quality of life, healthcare professionals do not always recognize these manifestations, test for them, or prescribe the latest or greatest treatments based on evidence [3]. The objective of this study was to determine the prevalence of orthostatic hypotension; describe their socio-demographic profile, the various clinical and paraclinical aspects and the predisposing factors of orthostatic hypotension in treated hypertensives, controlled or not.

2. Patients and Method

This was a descriptive cross-sectional study, from January 2 to June 30, 2022, carried out in the cardiology department of the Ignace Deen National Hospital. Were included in this study, all patients who presented orthostatic hypotension under antihypertensive treatment without distinction of age and gender and who agreed to participate in the study after informed consent. The non-inclusion criteria were hypertensive patients without OH and those who had not agreed to participate in the study. Each patient had blood pressure and heart rate measured. Supine at room temperature with an empty bladder. Then the measurement is taken again three (3) minutes after the switch to orthostatism. We retained the diagnosis of OH if the systolic blood pressure drops by at least 20 mmHg and/or the diastolic blood pressure by at least 10 mmHg three (3) minutes after the transition to orthostatism. Our study variables were epidemiological, clinical and paraclinical and therapeutic. Our data obtained were analyzed in the Epi-info 7.4.0 software.

3. Results

During our study period, we investigated 385 presented with OH, 12.2% (**Figure 1**). The mean age of the patients was 60.83 years \pm 10.01 years and hypertensive patients, 47 of whom the M/F sex ratio was 0.81. In our study, blood pressure was not controlled in 36.2% of our patients with a predominance of grade 3 hypertension, a rate of 55.32% (**Figure 2**). Renal failure, anemia, heart failure and stroke were the main comorbidities associated with the occurrence of HO (**Table 1**). The most incriminated factors were age with a frequency of 74.47%, followed by obesity 44.68% and diabetes 27.66% (**Table 2**). BP was normally controlled with a rate of 68.8% in treated hypertensive patients with OH. It is found much more in patients using triple therapy, a rate of 61.71% (**Table 3**).

Table 1. Frequency of patients with OH according to associated comorbidities.

Comorbidities	Effective	Percentage
Heart failure	9	19.15
Renal failure	21	44.68
Anemia	20	42.55
Stroke	9	19.15
Acute coronary syndrome	3	6.38
Atrial fibrillation	1	2.13

Table 2. Distribution of patients with OH according to cardiovascular risk factors.

Risk factors	Effective	Percentage
Age	35	74.47
Sex	35	74.47
Diabetes	13	27.66
Dyslipidemia	4	8.51
Obesity	21	44.68
Tobacco	9	19.15
Alcohol	2	4.26

Table 3. Distribution of OH cases according to the therapeutic line.

Association therapeutic	OH+	OH-	Effective	P-value
Bitherapy	15 (31.91%)	39 (11.53%)	54	0.02
Triple therapy	29 (61.70%)	297 (87.86%)	326	0.02
Monotherapy (Central Antihypertensives)	3 (6.38%)	2 (0.59%)	5	0.02

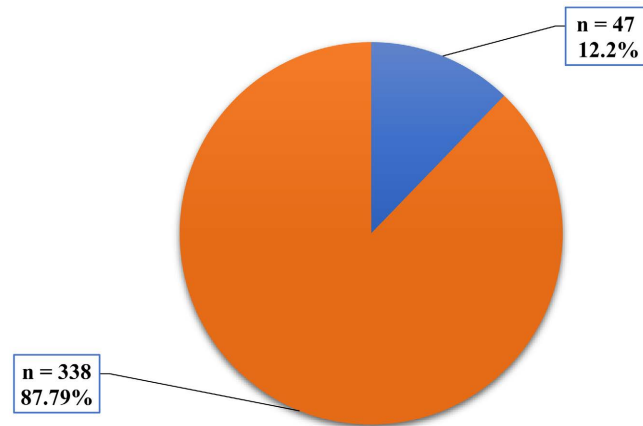


Figure 1. Prevalence of orthostatic hypotension in hypertensives.

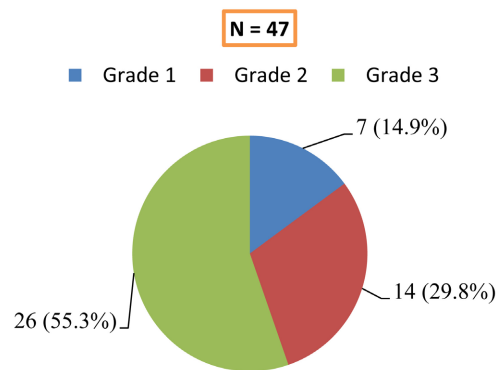


Figure 2. Distribution of OH cases according to the initial grade of hypertension on receipt.

4. Discussion

Our study took place in the cardiology department of the Ignace Deen National Hospital for 6 months from January 2 to June 30, 2022. This prospective descriptive study had the main objective of studying the prevalence and the contributing factors of orthostatic arterial hypotension (HO) appearing in hypertensives. We encountered some difficulties, in particular the non-evaluation of disabled patients due to the painful standing position, the prolonged refusal of orthostatism for certain elderly patients and the delay in the paraclinical assessment.

It involved 47 patients with orthostatic hypotension out of a total of 385 hypertensive patients, a hospital prevalence of 12.2%.

Our results can be superimposed on those found by MENTA I *et al.* in Mali [4] in 2014 who in their study had found a prevalence of 14%. However, our results remain lower than those of BARAGOU S *et al.* in Togo [5] in 2012 and the Belgian cohort in 2010 who found 20.5% and 37% respectively.

The wide variation in prevalence between studies can be attributed to sample size and the fact that most of these patients were poorly controlled blood pressure.

The most affected age group was that of 60 - 69 years with a frequency of 42.55%. The average age of our patients was 60.83 years \pm 0.91 years with extremes of 40 and 78 years. Our results are similar to those of a study carried out in Lomé by BARAGOU S *et al.* [5], who found 62 years \pm 9 years with extremes ranging from 26 - 81 years in 394 hypertensive patients. This predominance of advanced age can be explained by the predilection of cardiovascular diseases and its role which would be one of the main factors favoring HO.

In our series, the female sex was dominant with a frequency of 55.32% against 44.68%, a sex ratio M/F of 0.81. This predominance was also female in the study by KRAMOH K *et al.* [6] in 2006 with 50.8%.

All the professional strata of our patients were affected by HO with a clear predominance of civil servants and housewives, a frequency of 29.79%; followed by traders with 21.8%.

We found during our study that 72.34% of our patients with HO lived in urban areas against 27.66% who came from rural areas. This would be justified by the fact that the cardiology department of the Ignace Deen National Hospital is the reference service in the management of cardiovascular conditions in our country and given that traveling for consultations and care in Conakry would require a lot of time. Money, so there are only a privileged few who are able to benefit from a medical consultation in Conakry.

In addition to age and sex, the most represented risk factors in our study were obesity and diabetes with respective rates of 44.68% and 27.66%. In Ivory Coast SAGNON C in his medical doctoral thesis [7] in 2018 on orthostatic hypotension observed in Cardiology at the Bouaké University Hospital had found hypertension and dyslipidemia as risk factors with respective rates of 84.1% and 22.2%.

Dieulafoy's signs were the most frequent reasons for consultation with 78.72%. Our results are superior to those of MENTA I *et al.* in Mali [4] who reported 55.7% in their study. Our observation could be justified by the non-control of blood pressure on admission of patients to the service.

In our study, HO was symptomatic in 82.98% of stage II and III patients and asymptomatic in 17.02% of our patients. According to the functional signs of our patients, dyspnea was found in 55.3% of our patients followed by headaches with 51.1% while palpitations accounted for only 25.5%. Our results are almost identical to those of the MENTA study in Bamako [4] and the thesis of SAGNON C [7] in Abidjan, which found respectively 19% dizziness and 12.7% palpitations. The symptoms of HO in patients are diverse and numerous. In our study, we were more interested in the very frequent signs of HO.

In our study, blood pressure was normally controlled with a rate of 68.8% in hypertensive patients on treatment and with HO, while it was not controlled in 36.2% of our patients with a predominance of grade 3 hypertension, a rate of 55.32%. Our results are different from those of MENTA I *et al.* in Mali [4] who reported controlled blood pressure in 33.3% of cases and uncontrolled in 66.7% of cases.

On the electrocardiogram 57.45% of our orthostatic hypotensive patients had LVH, 6.38% of our patients presented an ST segment elevation while 17.02% of our patients had a normal ECG.

Our result is higher than that of RADA R in his doctoral thesis in medicine in Morocco [8] in 2017 where 25% of patients had electrocardiographic LVH and 20% of patients had repolarization disorders, while 15% had a normal ECG. In RUTAN GH *et al.*, HO was also associated with LVH [9].

This could be explained by the more frequent occurrence of HO in the event of an abnormality on the ECG and the impact of the pathology on the heart chambers. This could be explained by the diagnosis of the repercussions on the ECG during the progressive forms of arterial hypertension. During our series, the tele thorax performed showed a predominance of cardiomegaly in 28 patients, 59.57%. Our result corroborates that of DJIGUIBA Y who in his doctoral thesis of State in medicine in Mali [10] in 2014 had reported that cardiomegaly was found more in late HO with 53.6% against 52.4% in early HO. Our result could be justified by a delay in diagnosis in our patients, which in the long run leads to an impact of CI on the heart, such as cardiomegaly.

The frequency of anemia was high in 42.55% of our patients who presented with HO. Our result is higher than that of FOFANA Y in his doctoral thesis in medicine in Mali [11] in 2014 which found 21.4%. As blood volume is one of the energetic components of the maintenance of orthostatic arterial pressure, the drop in hemoglobin leads to a modification of the hemodynamic response to orthostatism. A renal assessment was carried out in the follow-up of patients with orthostatic hypotension. Hypercreatinine was found in 44.68% of cases. Our result is superior to that of FOFANA Y [11] in his doctoral thesis in medicine in Mali in 2014, which reported a rate of hypercreatininemia and hyperuricaemia respectively of 7.1% and 19%.

In our sample, among the 47 patients who were studied, 23.41% of orthostatic hypotensives had dilated cardiomyopathy as the main etiology on cardiac Doppler ultrasound. DJIGUIBA Y [10] in his doctoral thesis in medicine in Mali in 2014 had reported an anomaly and alteration of the systolic ejection fraction of the left ventricle with a rate of 46% and 26% respectively at HO.

Our survey reports that orthostatic hypotension is found much more in patients using triple therapy, a frequency of 61.70%. Our results agree with those of KAMARUZZAMAN in his study on the association between orthostatic hypotension and medication use in the British Women's Heart and Health Study, which tells us that the use of 3 or more antihypertensives is a predictor of occurrence of HO [12]. Our results are different from those found by MENTA I which found a high risk of orthostatic hypotension with monotherapy (47.6%) and a moderate risk of HO with dual therapy 23.8% [4].

The most incriminated factors in our study were age and sex, a frequency of 74.47% for each; followed by obesity (44.68%) and diabetes (27.66%). This agrees with the data in the literature according to which age, obesity and renal insufficiency are among the factors contributing to orthostatic hypotension.

5. Conclusion

The prevalence of HO is high in our service. It is found much more in patients using triple therapy. The most incriminated factors were age followed by obesity and diabetes.

Conflicts of Interest

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

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