

Orthostatic Hypotension (OH) in a Population of Hypertensive Patients in the University Hospital Gabriel Touré (UH GT)

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Abstract: Objective: This study was intended to determine the prevalence of HO and characteristics of patients who had an OH. Methodology: The study was cross-sectional, conducted in the cardiology department of the UH GT from January to June 2013 in a population of known hypertensive patients aged over 15 years seen as outpatients and who agreed to participate in the study. OH and NonOH were used to name patients with and without OH. OH was looked up to 5 min. The analysis was performed with SPSS software. Results: The overall prevalence of OH was 31.8% Age, SBP, DBP and HR were lower for NonHO patients resp. $p = 0.004$, <0.0001 <0.0001 and 0.016 . The female sex had a low predictive value compared to male (OR 0.594 and $p = 0.011$). The OR for the occurrence of OH versus the age group ≥ 60 years were 1.974, 2.616 and 1.692 respectively for ages < 30 , 30-44 and 45-59 years ($p = 0.004$). The OR for the occurrence of OH versus compared to higher education level were 0,411, 0,326 et 0,716 ($p=0,049$) resp. for unschooled, primary and secondary level. Conclusion: OH is frequent in the hypertensive population with nearly a third of patients. His research must be extended up to 5 minutes.

Keywords: Hypertension, Orthostatic Hypotension, Cardiology, Bamako

1. Introduction

HO is defined by a fall of the blood pressure (BP) at the time of the passage in upright posture. The values selected are of 20 mmHg for the systolic blood pressure (SBP) and of 10 mmHg for the diastolic blood pressure (DBP) or an absolute value of SBP less than 80 mmHg in upright position [1-3]. In addition to unpleasant for the patients [4-5], she should be more frequent among hypertensive patients [6-7] and is considered as cardiovascular risk factor (CV RF) [8-10].

Most studies were carried out by seeking up to 3 minutes, moreover little is published about OH in the neighboring countries [11].

This study thus aimed to determine OH prevalence and characteristics of patients with OH.

2. Methodology

It was a cross-sectional study, carried out in the cardiology department of UH GT from January to June 2013.

All hypertensive patients of more than 15 years old, seen in ambulatorium and willing to participate in the study were included (Diagram 1). Approximately 8,9% of the patients were not included either because having made a stroke or because unable to stay upright without support.

The basic BP was obtained from the average of 2 measurements at rest, patient lying on his, then 4 measurements were successively carried out immediately after the upstanding, at 1,3 and 5 minutes in standing position. Measurements were carried out with an automatic BP-device of Hartmann model “Tensoval Comfort”.

The definition retained for OH was the fall of SBP of more than 20 mmHg and/or of DBP of more than 10 mmHg.

For the analysis 2 groups were formed: those with OH and those without resp. called OH and NonOH.

Data were collected on a formulary then inputted in a Microsoft Access 2007 Database designed for this purpose.

The analysis was carried out with software SPSS v 12 after initial treatment with Microsoft Excel 2007.

After a descriptive analysis of the sample, the cross tables made it possible to evaluate the prevalence of HO according to several variables and a logistic regression carried out for the categorical variables.

For the continuous variables, a variance analysis with post-hoc test was carried out to study associations between occurrence of the OH and various variables of the sample.

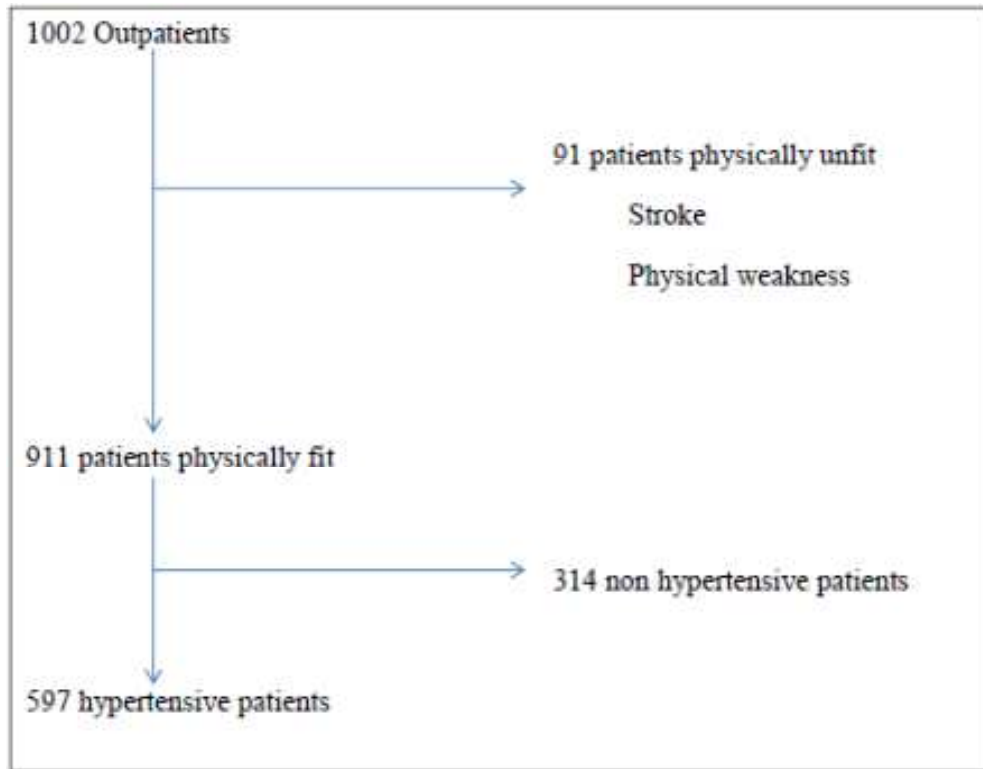


Figure 1. patients' selection for the study.

3. Results

The study involved 597 patients (374 of female sex, sex-ratio Men:Women=0.59), with a mean age of $54,15 \pm 13,542$ years.

The overall prevalence of OH was 31,8% (Diagram 2).

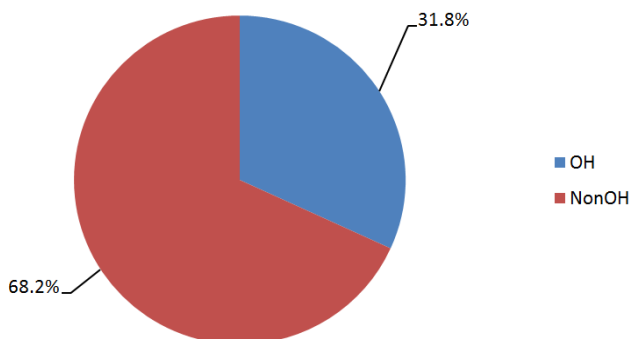


Figure 2. prevalence of OH in the population of 597 hypertensive patients.

Significant differences were found for age (56,46 for OH against 53,08 for NonOH with $p=0,004$), for SBP (158,96 for

OH versus 144,31 for NonOH), DBP (97,60 for OH and 90,00 for the NonOH with $p < 0,0001$) and HR of 86,52/min for the group OH against 83,29/min for the NonOH group with $p=0,016$. (Table I).

Table I. Description of the constants of the 597 patients of the sample.

Variables	OH (N= 190) Mean \pm SD*	NonOH (N= 407) Mean \pm SD*	p
Age	56,46 \pm 13,422	53,08 \pm 13,478	0,004
Weight	67,94 \pm 13,626	69,81 \pm 14,331	0,133
Height	164,34 \pm 7,413	165,57 \pm 7,553	0,062
BMI**	25,18 \pm 4,924	25,48 \pm 5,113	0,499
Baseline SBP	158,96 \pm 28,273	144,31 \pm 24,623	<0,0001
Baseline DBP	97,60 \pm 16,425	90,00 \pm 14,759	< 0,0001
Baseline HR	86,52 \pm 15,475	83,29 \pm 15,058	0,016

*SD: standard deviation, ** Body Mass Index

Socio-demographic characteristics significantly different were sex (70,5% of OH for the female sex against 29,5% for the male sex with $p=0,007$), the age (from 3,7% of OH in age under 30 years to 46,3% for patients older than 60 years with $p=0,007$) and the educational level (72,1% of OH among unschooled patients to 2,1% in those in higher level with

p=0003) (Table II).

Table II. Distribution of the socio-demographic variables and the cardiovascular risk factors.

Variables		OH N (%)	NonOH N (%)	p
Sex	Female	134 (70,5)	240 (59,0)	0,007
	Masculine	56 (29,5)	167 (41,0)	
	< 30	7 (03,7)	18 (04,4)	
Age range (years)	30-44	25 (13,2)	86 (21,1)	0,007
	45-59	70 (36,8)	171 (42,0)	
	>= 60 years	88 (46,3)	132 (32,4)	
	None	137 (72,1)	247 (60,7)	
Level of schooling	Primary	28 (14,7)	53 (13,0)	0,003
	Secondary	21 (11,1)	80 (19,7)	
	Higher	4 (02,1)	27 (06,6)	
Diabetes	Yes	19 (10,0)	34 (08,4)	0,510
	No	171 (90,0)	373 (91,6)	
Tobacco Smoking	Yes	33 (17,4)	80 (19,7)	0,506
	No	157 (82,6)	327 (80,3)	
Body Mass Index	Underweight	14 (07,4)	18 (04,4)	0,482
	Normal weight	83 (43,7)	192 (47,2)	
	Overweight	63 (33,2)	132 (32,4)	
	Obesity	30 (15,8)	65 (16,0)	

We didn't find significant difference in the crosstab number of medicaments and occurrence of orthostatic hypotension (Table III)

Table III. Crosstab of number of medicaments and orthostatic hypotension for 418 patients under medication.

Number of medicaments	Total sample N (%)	OH N (%)	NonOH N (%)	p
1	121	35 (28,9)	86 (71,1)	0,660
2	153	41 (26,8)	112 (73,2)	
3	137	43 (31,4)	94 (68,6)	
4	6	3 (50,0)	3 (50,0)	
5	1	0 (0,0)	1 (100)	

The logistic regression on significantly different variables in cross-tables allowed to find female sex (OR 0,594 and p=0,011).

Odd-ratios for the occurrence of OH versus the age group >= 60 years were 1.974, 2.616 and 1.692 respectively for ages < 30, 30-44 and 45-59 years (p = 0.004).

The OR for the occurrence of OH versus compared to higher education level were 0,411, 0,326 et 0,716 (p=0,049) resp. for unschooled, primary and secondary level (Table IV)

Table IV. Results obtained in logistic regression for the significant variables in bivariate analysis.

Variables		OR	95% CI	p
Sex	Female vs male	0,594	[0,398-0,888]	0,011
Age range	vs >= 60			0,004
	< 30	1,974	[0,771-5,059]	
	30-44	2,616	[1,509-4,536]	
	45-59	1,692	[1,124-2,547]	
Level of schooling	vs Higher			0,049
	None	0,411	[0,136-1,244]	
	Primary	0,326	[0,101-1,049]	
	Secondary	0,716	[0,222-2,314]	

4. Discussion

Our study was conducted in a large sample of 15 years and older hypertensive, including males and females with various educational levels. It thus made it possible to confirm certain data of the literature in particular:

- an overall prevalence of OH of 31,8%, lower than the 34,2 and 55% resp. of Weiss [13] and Poon [14]. It in particular higher than the 20,5% is obtained by Baragou [12], difference who could be explained by the research of OH in our study up to 5 minutes. This variability of the prevalence of OH depends on several factors and conditions [11-18]
- a higher mean age of OH patients and the increase in the prevalence of OH with the age (46,3% of our 60 years and older patients) as in other studies [1,12-14].
- our data suggested that more the blood pressure and the basic heart rate are high, more frequently occurred OH, this explainable on the one hand by the need for a greater number of drugs to lower BP. However even we did not find it in this study, many studies had highlighted a link between the number of drugs and the occurrence of OH [1,12]

In the majority of the studies, a male prevalence is found, which was not the case in our study, as in that of Fedorowski [19] which is a study on the general population.

We didn't find in the literature data on the educational level, which the more high the lower the occurrence of OH.

In this study we could not evaluate OH evolution in the time, which should be the subject of later studies.

5. Conclusion

OH is frequent among hypertensive population with nearly a third of the patients. The advanced age, the female sex, low education level, high baseline BP and HR are associated with a greater frequency of OH occurrence. The research of OH should be extended to 5 min in this group of patients

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