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ORIGINAL ARTICLE

Modifiable Risk Factors in Uncontrolled High Blood Pressure Patients of Banjul, Gambia

Factores de riesgo modificables en pacientes hipertensos no controlados de Banjul, La Gambia

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ABSTRACT

Introduction: high blood pressure is a risk factor that could lead to cardiovascular disease and stroke.
Objective: to assess the prevalence and association of the modifiable risk factors with uncontrolled blood pressure among hypertensive patients in Medical Outpatient Department in Edward Francis Small Teaching Hospital, Banjul, The Gambia.
Methods: a cross-sectional survey was carried out during November 2013; the sample comprised 146 hypertensive patients, after receiving informed consent, hypertensive patients were

interviewed about modifiable risk factors. Patients' blood pressure and body mass index were checked, the data was coded and processed using the Statistical Package for Social Sciences (version 15), a multiple logistic regression model was used to estimate the simultaneous effect of several determinants.

Results: the study showed that 52% of patients had uncontrolled blood pressure, 43.8% were overweight, 56.2% had unhealthy diet and 74.7% had physical inactivity, the predicted risk factors for uncontrolled high blood pressure, using univariate analysis were: unhealthy diet (p=0.000) and uncontrolled diabetes (p=0.007), the multivariate stepwise logistic regression analysis showed that for uncontrolled blood pressure the variables included as predictors: physical inactivity(p=0.793), overweight(p=0.631), unhealthy diet (p=0.170) and uncontrolled diabetes (p=0.28) were not significantly associated for uncontrolled blood pressure, the 78.9% of uncontrolled blood pressure had two or more modifiable risk factors, the number of modifiable risk factors were significantly associate with the control of blood pressure (Pearson X^2 = 22.667, p= 0.000)

Conclusions: the half of hypertensive patient were uncontrolled, the majority of patients had two or more modifiable risk factors.

Keywords: high blood pressure**,** risk factors, delivery health care, prevention and control.

RESUMEN

Introducción: la hipertensión arterial es un factor de riesgo que puede provocar enfermedad cardio y cerebrovascular.

Objetivo: evaluar la prevalencia y la asociación de factores de riesgo modificables con la hipertensión arterial no controlada, en pacientes hipertensos del Departamento de Consulta Externa del Edward Francis Small Teaching Hospital, en Banjul, La Gambia.

Métodos: se realizó un estudio descriptivo durante noviembre de 2013, la muestra estuvo conformada 146 pacientes hipertensos, después de obtener el consentimiento informado. Cada paciente fue entrevistado acerca de factores de riesgo modificables y se les determinó la tensión arterial y el índice de masa corporal, los datos fueron codificados y procesados usando el Statistical Package for Social Sciences (versión 15). Para estimar el efecto simultáneo de las variables predictores fue usado un modelo de regresión logística múltiple.

Resultados: el estudio mostró que el 52% de los hipertensos estaban no controlados, el 43,8% presentaban sobrepeso, el 56,2% seguían una dieta no saludable y el 74,7% inactividad física. Los factores de riesgo predictores en hipertensos no controlados (usando el modelo univariado) fueron: la dieta no saludable (p=0,000) y la diabetes no controlada (p=0,007). El análisis de regresión logística multivariada por pasos, mostró que las variables incluidas como predictores:

inactividad física (p=0, 793), sobrepeso (p=0,631), dieta no saludable (p=0,170) y diabetes mellitus no controlada (p=0,28) no estaban asociadas a la hipertensión no controlada, el 78,9% de los hipertensos no controlados tenía dos o más factores de riesgo modificables, el número de factores de riesgo modificables se asoció significativamente con la hipertensión no controlada (Pearson X^2 = 22.667, p= 0.000).
Conclusiones: la mitad de los pacientes hipertensos estaban no controlados, la mayoría tenía dos o más factores de riesgo modificables.

Palabras clave: hipertensión arterial, factores de riesgo, servicios de cuidados de salud, prevención y control.

INTRODUCTION

Heart disease is the leading cause of death in the United States[1]. High blood pressure, high cholesterol, and smoking are all risk factors that could lead to cardiovascular disease and stroke. There are two types of risk factors: controllable or modifiable and uncontrollable. Some risk factors, such as high blood pressure, unhealthy diet, obesity and smoking, can be controlled by medication or lifestyle changes. Other risk factors, such as age and race, cannot be changed[2].

The recently announced Million Hearts Initiative is aimed at preventing one million heart attacks and strokes over the next five years[3.] About 60 million people in the United States have hypertension, or high blood pressure, making it the most common heart disease risk factor, nearly one of three adults has systolic blood pressure over 140, and/or diastolic blood pressure over 90, which is the definition of hypertension[4], like cholesterol, blood pressure interpretation and treatment should be individualized, taking into account the patient entire risk profile, control blood pressure through diet, exercise, weight management, and if needed, medications.

The human, social and economic consequences of Non Communicable Diseases (NCDs), including hypertension, are felt by all countries but are particularly devastating in poor and vulnerable populations[5].

Reducing the global burden of NCDs is an overriding priority and a necessary condition for sustainable development, as the leading cause of death globally, NCDs were responsible for 38 million (68%) of the world's 56 million deaths in 2012, more than 40% of them (16 million) were

premature deaths under age 70 years, almost three quarters of all NCD deaths (28 million), and the majority of premature deaths (82%), occur in low- and middle-income countries[5] as The Gambia.

The aim of this study was to assess the prevalence and association of the modifiable risk factors with uncontrolled blood pressure among hypertensive patients in Medical Outpatient Department (MOPD)

METHODS

A cross-sectional survey was carried out during November 2013, in a sample of 146 hypertensive patients of Medical Outpatient Department at Edward Francis Small Teaching Hospital in Banjul, The Gambia, West Africa, after receiving informed consent, hypertensive patients were interviewed about age, diet, physical activity, history of diabetes mellitus and measurement of patients' blood pressure and body mass index was checked. Height was measured without shoes, and weight was recorded while wearing indoor clothing. Body mass index (BMI) (weight in Kg, divided by the square of the height in m^2) was calculated, in diabetic patients was taken a sample of fasting glucose, the blood pressure was measured three times with an interval of five minutes among measurement and the value average was used. Uncontrolled high blood pressure was considered an average systolic blood pressure of 140 mm Hg or more, or a diastolic blood pressure of 90 mm Hg or more[4]; persons defined as having uncontrolled high blood pressure may or may not have been taking medication, unhealthy diet when the intake of salt was more than five g/daily (2g of sodium daily), and they had an ingestion of soda beverage almost daily , physical inactivity when the patient had sedentary lives, exercising infrequently less than 30 minutes daily or not at all, overweight patients with body mass index was more than 25 kg/m^2 and uncontrolled diabetes is defined as having a consistent blood sugar level of over 7.2 mmol/l.

The data was coded and processed using the Statistical Package for Social Sciences (version 15), descriptive analysis, using standard statistical methods was performed, Chi-square tests were used to determine the association between the outcome variables, a multiple logistic regression model with backward selection (criterion: p-value to remove ≥ 0.10) was used to estimate the simultaneous effect of several determinants of uncontrolled high blood pressure among the sample population, the variables included as predictors were: unhealthy diet, physical inactivity, overweight and uncontrolled diabetes.

The study followed the recommendations of the Clinical Research Ethics Committee (CEIC) of our hospital.

RESULTS

The characteristic of the study population with means age of 52±16 years, 71, 2% females, 52% had uncontrolled blood pressure, 43.8% were overweight, 56.2% had unhealthy diet, 74.7 % had physical inactivity and 52 % had uncontrolled diabetes (table I).

Table I. Characteristic of the study population. MOPD. 2013

Variable	n (146)	Percentage
Age (years)	-	52±16*
Age < 65 years	38	26 %
Female sex	104	71.2 %
Diabetes Mellitus	80	54.8 %
Overweight	64	43.8 %
Unhealthy diet	82	56.2 %
Physical inactivity	109	74.7 %
SBP (mm Hg)	-	148.6±19.5*
DBP (mm Hg)	-	98.4±4.6*
Glycemia(mmol/l)**	-	9.8±4.6*
Uncontrolled BP	76	52 %

* (mean ±SD) ** Only in diabetic patients

The predicted risk factors using univariate analysis: unhealthy diet (p=0.000) and uncontrolled diabetes (p=0.007) were significantly associated for uncontrolled blood pressure (table II).

Table II. Uncontrolled high blood pressure in relation with modifiable risk factors.MOPD.2013

Variable		Uncontrolled Blood Pressure (n=76)	Controlled Blood Pressure (n=70)	Pearson X^2	P value
Overweight	Yes	31	33	0.597	0.122
	No	45	37		
Unhealthy Diet	Yes	31	51	15.220	0.000
	No	45	19		
Physical Inactivity	Yes	22	15	1.089	0.297
	No	54	55		
Uncontrolled Diabetes Mellitus*	Yes	17	29	7.21	0.007
	No	22	12		

* Only was calculated in diabetic patients

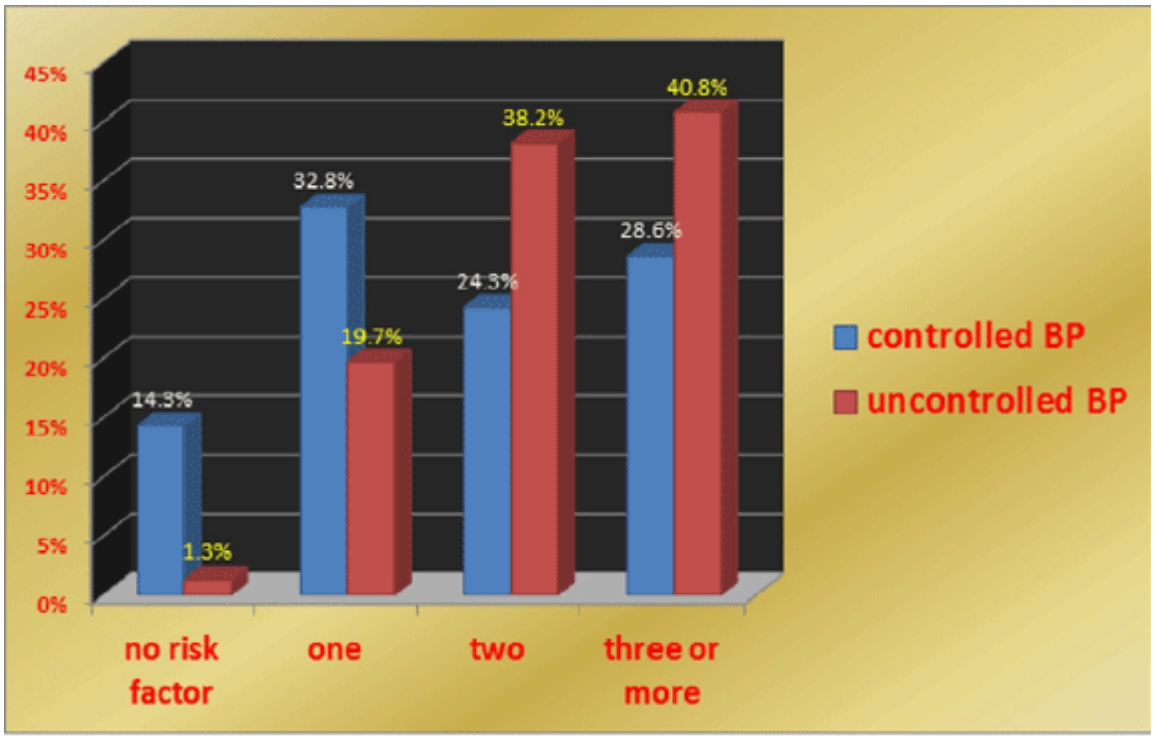
The multivariate stepwise logistic regression analysis showed that for uncontrolled blood pressure the variables included as predictors: physical inactivity (p=0.793), overweight (p=0.631), unhealthy diet (p=0.170) and uncontrolled diabetes (p=0.28) were not significantly associated for uncontrolled blood pressure (table III).

Table III. Multivariate analysis of risk factors for hypertensive patients.MOPD.2013

Variable	Regression coefficient	P value	95 % Confidence Interval
Overweight	-0.343	0.631	0.175-2.86
Unhealthy Diet	-0.778	0.170	0.15-1.39
Physical inactivity	-0.169	0.793	0.240-2.968
Uncontrolled Diabetes mellitus*	-1.263	0.28	0.92-8.70

* only was calculated in diabetic patients

Of 146 hypertensive patients, 97 of them (66.7%) had two or more modifiable risk factors and 78.9% of the 76 uncontrolled blood pressure patients ,60 of them had two or more modifiable risk factors the number of modifiable risk factors, (graphic 1) were significantly associate with the control of blood pressure (Pearson $X^2 = 22.667$, p=0.000) (table IV)



Graphic 1. Modifiable risk factors considering controlled BP and uncontrolled BP

Table IV. Number of modifiable risk factors according to control of BP. MOPD.2013

Number of risk factors	Controlled Blood Pressure		Uncontrolled Blood Pressure	
	No	%	No	%
No	10	14.3	1	1.3
One	23	32.8	15	19.7
Two	17	24.3	29	38.2
Three or more	20	28.6	31	40.8

BP: blood pressure Pearson X^2 22.667 p 0.000

DISCUSSION

Raised blood pressure is estimated to have caused 9.4 million deaths and 7% of disease burden as measured in 2010. If left uncontrolled, hypertension causes stroke, myocardial infarction, cardiac failure, dementia, renal failure and blindness[5].

Many modifiable factors contribute to the high prevalence rates of hypertension. They include eating food containing too much salt and fat, inadequate intake of fruits and vegetables, overweight and obesity, harmful use of alcohol, physical inactivity, psychological stress, socioeconomic determinants, and inadequate access to health care[5-7]

Shortcomings in public health policies to address intake of salt and fruits and vegetables, physical inactivity, and overweight and obesity have resulted in rising trends in blood pressure in low and middle-income countries and the number of people with undetected and uncontrolled hypertension has increased worldwide because of population growth and ageing. Hypertension is not an inevitable consequence of ageing. In the majority of cases, the exact cause of hypertension is unknown, but the presence of several of the above factors, increase the risk of developing the condition. Most of these above factors are modifiable[5, 7, 8].

Regular physical activity reduces the risk of ischemic heart disease, stroke, diabetes and breast and colon cancer. Additionally, regular physical activity is a key determinant of energy expenditure and is therefore fundamental to energy balance, weight control and prevention of obesity, across all regions; women were less active than men, with differences in prevalence between men and women of 10%[9].

Excess consumption of dietary sodium is associated with increased risk of hypertension and cardiovascular disease. It has been estimated that excess sodium intake was responsible for 1.7 million deaths from cardiovascular causes globally in 2010[3]. The main dietary source of sodium

worldwide is salt, considerable evidence shows that lowering sodium consumption can reduce blood pressure and it is also associated with cardiovascular disease events in persons who consume more than 3.5 g/day of sodium[10, 11]

It is widely accepted that Cardiovascular Diseases (CVDs) constitute a major public health problem worldwide, the lifetime risk of CVD is substantial, and the condition is often silent or may strike without warning, underscoring the importance of prevention[5, 12, 13]

The evidence of risks of high blood pressure and the consistent reduction of such risks by clinical trials of blood pressure-lowering agents are robust proofs of the concept that high blood pressure is a major cardiovascular risk. Top priority should be accorded to implementation of public health policies to reduce exposure to modifiable risk factors, there is strong scientific evidence of the health benefits of lowering blood pressure through population-wide and individual (behavioral and pharmacological) interventions[5]

First heart attacks and strokes can be prevented if high-risk individuals are detected early and treated, these interventions can be delivered to persons with raised cardiovascular risk, including those with hypertension, diabetes and other cardiovascular risk factors with medium-to-high cardiovascular risk, through integrated primary care programmes[5, 14].

Investments are needed to improve health-service infrastructure and human and financial resources, to create a health-care system that is capable of deploying and sustaining equitable and quality-assured programs for addressing cardiovascular risk

Integrated Non Communicable Diseases (NCDs) programs can be established at the primary care level, using Word Health Organization (WHO) guidelines and tools. One objective of an integrated program is to reduce total cardiovascular risk to prevent heart attack, stroke, kidney failure and other complications of hypertension and diabetes[15, 16]

Preventable deaths from heart disease, stroke, and hypertensive disease could be prevented by more effective public health measures, lifestyle changes, or medical care[17, 18]

This study has limitations: the findings were based on a small population, those patients that came to the hospital, the time period of analysis was relatively short, the majority of the patients were from urban region. Therefore the results cannot be generalized for the general population. The study was not economically supported.

The health providers should encourage healthy habits at every patient visit, including not smoking, increasing physical activity, eating a healthy diet, maintaining a healthy weight, and taking medicines as prescribed.

CONCLUSIONS

The half of hypertensive patients were uncontrolled, the majority of patients had two or more modifiable cardiovascular risk factors.

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Disclosure

The authors report no conflicts of interest in this work.

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