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Research Article

Nutritional Status and Dyslipidemia in Hospital Hypertensive Patients, Burkina Faso

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Abstract

Obesity, dyslipidemia, hypertension, and smoking are some of the risk factors for atherothrombotic diseases that cause stroke and the occurrence of myocardial infarction. One of the causes of the occurrence of these diseases is food. However, few studies have examined the relationship between diet and lipid disorders in Burkina Faso. The objective of this study was to highlight the links between dietary habits, nutritional status and the risk of dyslipidemia in hospital hypertensive patients. This was a prospective 4-month study, which involved 100 hypertensive patients aged 25 to 65 received in consultation at 3 Medical Centers of Ouagadougou. Nutritional status was assessed using patients' Body Mass Index (BMI) and a 24-hr recall was used to collect their dietary habits. Total cholesterol, Low Density Lipoprotein (LDL)-C, High Density Lipoprotein (HDL)-C and blood triglyceride levels were collected from the results of patient examinations. Statistical analyzes (T-test) were performed with SPSS v.20 software with a 95% confidence interval. A total of sixty-three women and 37 men with an average of 45.39 ± 8.33 years of age were included. The prevalence of obesity was 31% with 15% of severe obesity (35.0 ≤ BMI ≤ 39.9). Women were the most affected (p=0.03). Patients with inadequate dietary habits were at greater risk of obesity. The weight status was significantly associated with the occurrence of a metabolic disorder including dyslipidemia (p=0.003). Inadequate dietary habits significantly increased the risk of atherothrombotic disease in these patients who already had known cardiovascular disease.

Keywords: Obesity; Dyslipidemia; Cardiovascular Diseases; Burkina Faso

Abbreviations

BMI: Body Mass Index; HC: Hip Circumference; HTA: High Blood Pressure; NDC: Noncommunicable Chronic Disease; LDL-C: Low Density Lipoprotein-C; HDL-C: High Density Lipoprotein HDL-C

Introduction

Like industrialized countries, a number of emerging and developing countries that are gradually breaking away from food security problems are increasingly confronted with food-related noncommunicable chronic disease [1]. These diseases have many disastrous human, social and economic consequences, particularly for the poor and vulnerable [2]. NCDs are the leading cause of death in the world today: around 88% of deaths in industrialized countries and 40% of deaths in developing countries [3]. Among these chronic noncommunicable diseases, some have a recognized link with diet and lifestyle, physical inactivity, smoking or alcohol consumption. These include hyperlipidemia, non-insulin dependent diabetes, high blood pressure, cardiovascular disease and certain cancers [4] On the African continent, many countries have necessarily focused their efforts primarily on under nutrition and food insecurity, resulting in insufficient data on the these NCDs. A secondary analysis of STEPS survey data in Burkina Faso showed prevalence of hypertension of 17.2%, fasting hyperglycemia of 2.1%, total hypercholesterolemia of 3.9%, overweight and obesity by 13.2% and 4.4% respectively and smoking by 12.2% [5]. Another hospital study found a prevalence of 61.4% of obesity and 10.1% of massive obesity [6]. More than 50% of deaths and disabilities resulting from cardiovascular disease and stroke can be prevented by reducing major risk factors, such as obesity, hypertension, dyslipidemia and smoking [7]. However, few studies have examined the relationship between diet and lipid disorders in Burkina Faso. The present study aimed to examine the relationships between eating habits, nutritional status and the risk of dyslipidemia occurring in hypertensive patients in hospitals.

Material and Methods

This study took place in three medical centers of Ouagadougou, from July to November 2013. This was a prospective study based on the interrogation of patients received in the various cardiological departments for consultation. The study focused on hypertensive patients aged 25 to 65 years.

Variables and data collected

The variables studied were sociodemographic data, including age, sex, occupation and level of school education. Anthropometric data (weight, height, waist circumference, hip circumference), data on eating habits and lifestyles (hobbies, smoking) and clinical data (medical history, biological parameters) were also collected. A survey form was used for data collect. These were socio-demographic, anthropometric, clinical, dietary habits, leisure, smoking data. The clinical and anthropometric data were respectively obtained from the patient's medical report (exam results) and measurements directly from the patients. Informed patient consent was required before the

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start of the interview.

Measures

Body Mass Index (BMI)

The measurement of the size was made with a height gauge SECA, graduated in millimeters and maximum range of 220 cm. The size was taken in standing position. The weighing was carried out with a 100g precision SECA scale with a maximum range of 120 kg. The weight was taken with the clothes without the shoes. BMI was calculated by dividing the weight in kilograms by the square of the height in meters [8].

Waist circumference to hip circumference ratio

The distribution of adipose tissue was assessed by the Hip Circumference (HC) ratio. Obesity was considered to be of the android type (abdominal distribution) if the RTH was greater than 0.9 in women and 1 in men and of the gynoid type (femoro-gluteal distribution) if HC is greater than 1 in women and at 0.9 in humans [9,10].

Diagnosis of dyslipidemia

Dyslipidemia was established by comparing the results of the biological test of the patients to the reference values in order to assess the risk of cardiovascular events incurred by the patients. These were the values for cholesterol (total, LDL-C, HDL-C) and triglycerides. Cardiac Doppler ultrasound images were also collected.

Inclusion criteria

All patients with the following characteristics are included in this study:

- Patient from 25 to 65 years of age diagnosed hypertensive treated or untreated.
- Patient with or without lipid abnormality (dyslipidemia characterized by Total cholesterol ≥ 6.72 mmol/l, LDL cholesterol ≥ 3.4 mmol/l; triglyceride > 1.82 mmol/l in men and > 1.54 in women, HDL > 1.55 mmol/l in men and 1.81 mmol/l in women.

Ethical Consideration

The study was carried out thanks to a research authorization issued by the Regional Health Directorate of Centre N°2013-000731/MS/RCEN/DRSC of 08 July 2013.

Data analyses

The data was entered on an Epi info version 3.5 basis and then exported on SPSS v 20 for the different statistical analyzes. The differences observed between the groups were evaluated with a significance level of 5% and a 95% confidence interval. Histograms and tables were made with Excel 2010 software.

Results

Group description

A total of 110 participants including 63 women and 37 men were included in this study, a sex ratio of 1.7 lower than that found by Zabsonré et al. 2.7 [6].

Tobacco, Alcohol and Physical Activity

Five percent (5%) of patients (age 40-50) reported smoking at period of the study, and seven percent (7%) of patients said they were currently drinking alcohol. As for physical activity, none of the patients practiced sport at the time of the survey. Data from the STEPS survey showed in 2013 that 11.3% of adults aged 25 to 64 smoke tobacco. Those who consumed alcohol represented 27.3% and 62.8% of those surveyed had no physical activity [11].

Table 1: Distribution of nutritional status according to the dietary preferences of the patients interviewed.

	Underweight	Normal	Overweight	Obese	p
Vegetables	2	29	36	31	0,13
Fruit	0	7	4	7	0,91
Rice, wheat, pasta, bread, corn	2	29	37	31	0,049*
Fish or seafood	0	4	11	16	0,003*
Sweet drink	0	1	6	9	0,04*
Alcoholic drink	0	1	3	3	0,01*
Dairy products	0	3	7	6	0,048*
Fried foods	0	0	3	6	0,037*
Grilled meat	0	7	11	12	0,029*
Add oil to meals	0	0	2	5	0,013*

*p significant value

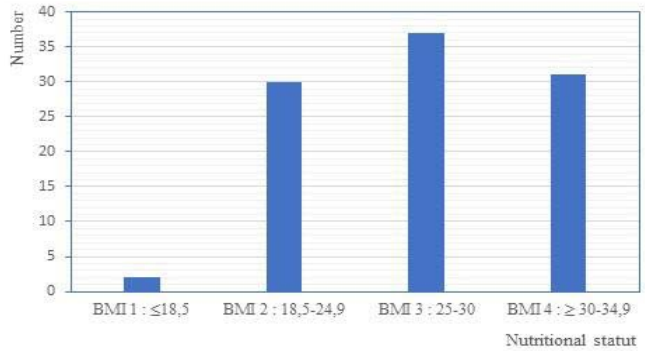

Figure 1: Distribution of patients according to their nutritional status.

Risk factors for obesity and associated metabolic disorders

Assessment of nutritional status (BMI) gave the results shown in Figure 1.

Thirty-seven (37%) of the patients included in this study were "overweight" and 31% were obese. Fifteen percent (15%) of obese patients developed so-called significant obesity (obese grade II=35.0 ≤ BMI ≤ 39.9) and only 2% of patients were underweight (BMI ≤ 18.5). Thirty-one percent of the patients were obese (24% female and 7% male), of whom 15% obese grade II (35.0 ≤ BMI ≤ 39.9) lower than those obtained by Zabsonré et al. 61.4% obesity and 10.1% massive obesity (BMI ≥ 40 kg/m²) in hospital [6].

The results of food consumption frequencies according to BMI are presented in Table I.

The distribution of food preferences according to nutritional status shows that people with a BMI4 (obese) and a BMI3 (overweight) consumed more whole foods, raw or prepared vegetables, fish, sweets drink, alcoholic drink, fried foods, grilled meat and added oil to their meal.

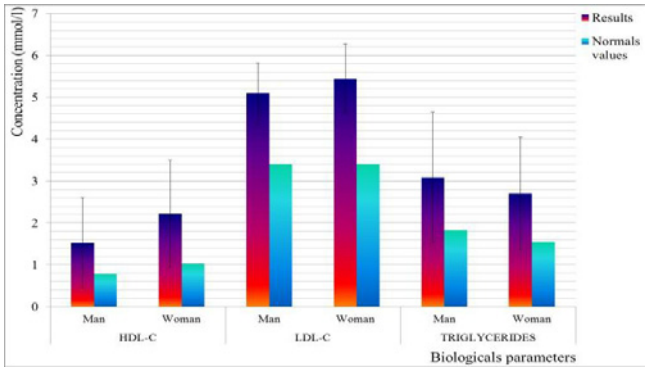

Figure 2: HDL, LDL and triglyceride concentrations in patients with dyslipidemia.

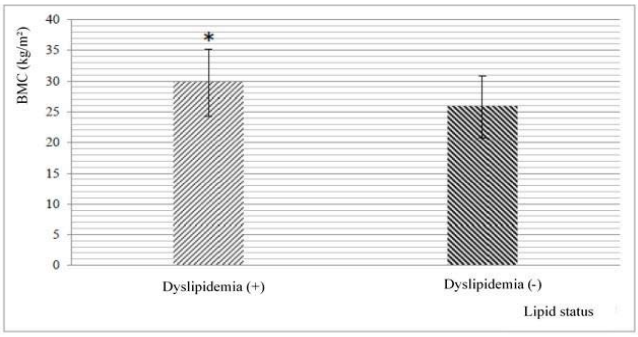

Figure 3: Distribution of BMI according to lipid status.

Photo 1: Doppler ultrasound with an intra-cardiac thrombus.

Photo 2: Doppler ultrasound with intra carotid thrombus.

Figure 2 shows the different LDL-C, HDL and Triglyceride levels obtained in patients with lipid abnormalities.

The HDL-C, LDL-C and triglyceride concentrations obtained in patients with metabolic disorders were 1.57 mmol/l of HDL-C, 5.26 mmol/l of LDL-C and 2.05 mmol/l of triglyceride, respectively.

Diagnosis of the lipid anomaly as a function of BMI (Figure 3).

The results showed a statistically significant difference between the BMIs of the different groups of patients included in this study ($p = 0.003$). In fact, the average BMI of dyslipidemia (+) patients are 29.73 compared to 25.83 for patients without a lipid abnormality.

Doppler ultrasound images

Photos 1 and 2 show intracardiac thrombus and atheromatous plaque at the carotid artery (neck artery) in some obese patients respectively.

Discussion

The importance of obesity as a risk factor for a number of diseases, including dyslipidemia, has been reported by many studies [12]. This work allowed to appreciate the clinical contours of this problem in a cardiological environment in a developing country. Rather than exhaustively taking into account all the risk factors for the occurrence of cardiovascular events related to obesity, this study looked at those that seem to be the most characteristic in developing countries, particularly dietary habits and dyslipidemia. Women were more likely to attend health centers than men and were the most represented in all classes of BMI. Overweight was gynoid in 51.6% of the patients declared obese and the android type was found in 48.4% of the cases. Women (15 out of 16, or 93.75%) were more likely to have gynoid obesity (femoro-gluteal distribution) and men (9 out of 15, or 60%) had android obesity (abdominal distribution), $p=0.03$ between gender. People with BMI4 (Obese) and BMI3 (Overweight) consumed more foods that were incriminated in weight gain, including whole foods, sweets, fried foods, grilled meat, and added oil to their meals [13-15]. The metabolic disorder in the patients of this study was characterized on average in men by a fall of the rate of HDL-C and a very important increase of the rate of triglyceride but the contribution to the occurrence of cardiovascular event risks is independent in both sexes [16]. While in women, the lipid profile was marked by an increase in HDL-C and a lower increase in triglyceride levels compared to men. In both gender, there is an increase in LDL-C "bad cholesterol". The metabolic disorder (dyslipidemia) affected women more than men which could be related to the number of women in this study. Weight was a very important risk factor for the occurrence of dyslipidemia in patients ($p=0.003$). Smoking, blood pressure and dyslipidemia (LDL-C) are recognized to be classic risk factors for atherothrombotic damage to the arteries of the heart, brain and lower limbs [17,18] as seen on the doppler images. Weight is the third most important predictor of coronary heart disease after age and dyslipidemia [12].

Conclusion

This study has shown that inadequate dietary habits associated with lack of physical exercise expose some patients to overweight (obesity) which intimately related to the occurrence of dyslipidemia.

This work allowed to appreciate the clinical contours of this problem in a cardiological environment. Medication management of these metabolic disorders and nutritional counseling could significantly reduce the risk of atherothrombotic disease in these patients who already have experienced cardiovascular disease (HTA).

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