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Nutritional Risk Factors in the Cardiovascular Patients

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Abstract

***Background*:** With respect to the effective dietary factors on heart diseases (HDs), the present research aims to study the dietary risk factors of people with cardiovascular diseases.

***Materials and Methods*:** The demography and anthropometric information as well as the nutritional condition for 80 patients hospitalized in the Cardiovascular Ward of Zahedan Khatam al-Anbia (PBUH) Hospital were determined through dietary recall and indices of lipid profile.

***Results*:** As per the findings of this study, for BMI, 26.2% of the patients were overweighed, 10.1% of patients had obesity, and 43.5% of the patients had abdominal obesity for waist to hip ratio. The mean of cholesterol, triglyceride, LDL, and HDL were 198.2±52.8, 136.8±66.3, 139±35.4, and 40±10.2 mg/dl, respectively. Imbalance in the macronutrient intakes were observed in patients.

***Conclusion*:** Given the fact that the indices under study are inappropriate, the patients are those who are subject to cardiovascular diseases in a constant and chronic manner.

Introduction

The cardiovascular disease (CVD) is the leading deadly disease in the world. It takes several decades for the disease to show its symptoms [1]. On the other hand, the important and amendable factors in lifestyles are nutrition intake, which is consistent with the physiological and metabolic conditions and nutritional requirements [2]. The epidemiologic studies refer to smoking, hypertension, hyperlipidemia, diabetes, gender, family background of coronary diseases as the risk factors [1, 3]. Studies considered obesity, distribution of fat in body and abdominal obesity as the risk factors [4]. Several factors are effective in obesity including age, gender, marital status, income and occupation [5]. They affect through influencing diet and culture of foodstuff consumption and physical activities. The epidemiological, experimental and clinical studies indicated that dietary factors, such as lipids profiles and arthritis, affect CVD [6]. Dietary pattern and obesity are among the most important environmental risk factors.

Therefore, studying food intake and anthropometry indices along with biochemical findings such as lipids profiles provide useful information in this field [7]. The present research has been designed to examine the nutritional status, anthropometric and lipid indices in CVD patients hospitalized in Zahedan Khatam al-Anbia (PBUH) Hospital to study their vulnerability in connection with the above factors.

Materials and Methods

In this descriptive study, 80 patients with heart problems (pain in chest, echocardiography and CKMB activity) who visited Zahedan Khatam al-Anbia (PBUH) Hospital and were hospitalized in CCU and Post-CCU wards were selected through randomized sampling. After registering the demographic characteristics of the patients including age, gender, occupation and educational level, their weight was measured by Seca platform scale with 0.5 kg accuracy. Their weight was measured using non-elastic metering device with 0.5cm accuracy in standing position alongside the measuring wall.

Their BMI was obtained through dividing their weight (kg) by the square of height (m^2). The sizes of their wrists were measured by a non-elastic metering device. Their body type was determined through dividing the height by wrist circumference into small, average and large[2] size, and the waist to hip ratio was reported to be less than the unit [6]. Their blood pressure was taken by a mercury pressure meter on one arm of the patients. The dietary intake of a patient was completed during 48 hours by recall-48 hr and an interview with a master of dietary expert. The kinds of foods eaten by each people in three main meals and snacks were registered during the interviews, which have been made during two days. Then, the energy, carbohydrate, proteins, fats, vitamins and minerals per capita were determined and compared with the recommended dietary allowances (RDA) [6].

In addition, the Food Frequency Questionnaire (FFQ) was used to determine the consumption pattern. After taking 5ml of blood from the fasting patients and separating serum, the contents of cholesterol, triglyceride and HDL were measured by enzymatic method [8]. The LDL was calculated by Friedewald equation [9].

LDL= Total cholesterol - (HDL + Triglyceride / 5)

Results

According to the findings of the present study, the patients' mean age was 57.3±14.8, which included 51 (63.8%) men and 29 (36.2%) women (Table 1).

Table 1. Anthropometric characteristics of patients

Indices	Sex	Mean±SD
Body.Weight (kg)	Male	68.5±14.4
	Female	60.6±12.7
Height (Cm)	Male	168.7±9.3
	Female	157.6±7.5
BMI (kg/m^2)	Male	23.9±3.7
	Female	24.6±5.7
Waist/hip	Male	1.03±0.11
	Female	0.97±0.12
Small size	Male	9.0±0.4
	Female	11.6±0.4
Medium size	Male	9.9±0.2
	Female	10.4±0.2
Big size	Male	10.7±0.2
	Female	9.5±0.6

In terms of BMI, 9.8 % of men and 10.3 % of obese women were evaluated. Although the average of lipids profiles was acceptable as compared with the standard, the changes of above indices, especially cholesterol, LDL and HDL, indicate that the patients are further subject to risks (Table 2).

Table 2. Means and standard deviations of lipid profile in patients

Groups / Indices	Male	Female
Cholesterol (mg/dl)	198.2±52.8	198.7±46.5
Triglyceride (mg/dl)	136.8±66.3	160.3±62.5
HDL (mg/dl)	40.0±10.2	37.0±11.5

Discussion

This study indicated that the age range of those suffering from the cardiovascular problems in both males and females included young, middle-aged and old patients (17-88 years old). Most patients with the cardiovascular problems were 50-60 year old men (32.8%) and 40-50 year old women (29.1%). Sixty-five percent of the patients were illiterate. According to other the risk factors, 53.8% of the patients had hypertension. Subsequently, of hyperlipidemia was observed in 36.4% of them. Obesity, according to range of BMI and waist to hip ratio in patients under study as compared standards indicates their vulnerability. The range of Body mass Index (15.2-40.9 kg/m^2) indicates the crises of nutritional status in terms of obesity. As far as the waist to hip ratio is concerned, 50.6% of men and 36.4% of women were subject to risk of android obesity and gynoid obesity, respectively.

The patients under study might have suffered from these diseases chronically. Of course, the estimated value of this index along with the other anthropometry and laboratory measurements and consumption examination can increase the validity of the above index [10]. According to the findings of the study in terms of body size, 45.1 % of men and 55.2% of women were big size. Which can be increased of adipose tissue in body in parallel to others risk factors of CVD. As evidence indicates, there is a higher risk of cardiovascular diseases for those with concentrated fat in abdominal area.

The size of waist circumference is proposed as a superior index to BMI or waist to hip ratio to predict abdominal obesity and the risk of CVD. In addition, the lipids profiles contents in patients had some fluctuations. Indices like blood cholesterol and triglyceride are among the risk factors. Along with other factors, they can be of high value in predicting an incidence. To study the CVD risk factor in Tehran, indices like cholesterol more than 200 mg/dl, HDL less than 40 mg/dl, LDL exceeding 130 mg/dl and the increase of BMI are mentioned which may cause atherosclerosis and CVD disease with the oxidation of LDL [11, 12, 13].

In terms of the range of the intake energy (1207-4221 Kcal/d), it seems that some of the people under study had more than the standard energy. The share of each macronutrient (carbohydrates, proteins, fats) to provide the daily total energy would be 45±9.6 percent, 21.8±4.9 percent and 33.7±10.3 percent, respectively. The ratio of carbohydrates to provide the daily energy is less than the rest of macronutrients, which indicates that the rest of macronutrients should be consumed to provide the energetic requirements, which means the waste of protein valuable dietary resources.

In the dietary guide of the American Health National Institute, the percentages of carbohydrates, proteins and fats are recommended to be 50-60, 10-20, and less than 30, respectively [6]. In this research, the decrease of the natural antioxidant intake including vitamin A (76%), vitamin E (100%), and vitamin C (80%) indicates the crisis of nutrients deficiency. Studies show that consumption of fruits and vegetables, due to having high amounts of antioxidant, decreases the cardiovascular problems and low serum levels of vitamin C and selenium, folate, vitamins B_6 and B_{12} cause CVD complications [14].According to the research findings "The hospitalized cardiovascular patients are under treatment and with respect to their age and gender characteristics, lack of balance in nutritional status, anthropometric and biochemical findings, it seems that they are constantly and chronically subject to risk. In addition, lack of the daily-required energy can create limitations on the intake of other macro- and micronutrients, which affect the trend of disease."

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Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest
The authors declare no conflict of interest.

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