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Research Article

ANALYSIS OF IMPACT OF METABOLIC SYNDROME ON NUTRIENTS INTAKE AMONG FEMALES

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Abstract:

Introduction: Metabolic syndrome (MetS) is characterized by a clustering of abdominal obesity, insulin resistance, hypertension, dyslipidemia, and diabetes mellitus, which are considered to contribute to increased incidence of cardiovascular disease and mortality. **Aims and objectives:** The basic aim of the study is to find the impact of metabolic syndrome on nutrients intakes among females in Pakistani environment. **Material and methods:** This cross sectional study was conducted in hospitals of Gujrat during 2018. In this study we find the impact of metabolic syndromes on nutrients intake. All participants with MetSyn at baseline were excluded in this study. 50 patients were randomly selected as the case group, and 123 patients agreed to participate and provided complete information. For the control group without MetS, 150 age-, gender- and residence area-matched subjects with no history of obesity, hyperlipidaemia, hypertension, or diabetes mellitus were selected, and the data from 135 subjects were analyzed. **Results:** The patients with MetS had significantly higher blood pressure, BMI, and WC and higher levels of TG, TC, LDL-c, FBG, and UA but lower HDL-c levels than those in the control group. The patients with MetS were more likely to be smokers and had a lower education level. In regard to dietary nutrient intake status, intake of energy, total fat, cholesterol, and sodium were significantly higher and intake of vitamin E and magnesium were relatively deficient in the patients with MetS compared with the control group. **Conclusion:** It is concluded that vitamin B group pattern was negatively associated with the risk of MetS. Our findings suggest that intake of B vitamins as a whole might be a simple and effective way to prevent or slow the development of MetS.

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INTRODUCTION:

Metabolic syndrome (MetS) is characterized by a clustering of abdominal obesity, insulin resistance, hypertension, dyslipidemia, and diabetes mellitus, which are considered to contribute to increased incidence of cardiovascular disease and mortality. With the economic development of China, the prevalence of MetS has increased significantly [1]. According to the 2002 Chinese National Nutrition and Health Survey, the prevalence of metabolic syndrome in individuals aged ≥ 18 years was 13.8% based on the Adult Treatment Panel III criteria and has increased strongly over the past few years; some studies have shown that the prevalence of MetS at a regional level is approximately 13.2% to 15.8%. With this increase in prevalence, MetS has become a major public health problem [2].

Although dietary intake has been linked to individual components of MetSyn, the role of diet in the origin of MetSyn is not well understood. Cross-sectionally, dietary intakes rich in whole-grain foods have been linked to a lower prevalence of MetSyn [3]. The evidence is less consistent for refined-grain intake, with some cross-sectional studies reporting a positive association and others finding no relation. Dairy intake has been inversely associated with MetSyn both cross-sectionally and prospectively [4]. Greater intakes of fruit and vegetables also have been associated with a lower prevalence of MetSyn. No association has been found between MetSyn and intakes of meat and fish. Intakes of regular and diet soda, however, have been positively associated with MetSyn both cross-sectionally and prospectively [5]. In cross-sectional dietary pattern analyses, a greater prevalence of MetSyn was found among consumers of “Western” and “empty-calorie” dietary patterns, whereas a lower prevalence was found among those consuming a “healthy” dietary pattern [6]. Associations between MetSyn and intakes of fried foods, coffee, and nuts have yet to be assessed among adults [7].

Aims and objectives

The basic aim of the study is to find the impact of metabolic syndrome on nutrients intakes among females in Pakistani environment.

MATERIAL AND METHODS:

This cross sectional study was conducted in hospitals of Gujrat during 2018. In this study we find the impact of metabolic syndromes on nutrients intake. All participants with MetSyn at baseline were excluded in this study. 50 patients were randomly selected as the case group, and 123 patients agreed to participate and provided complete information. For the control group without MetS, 150 age-, gender- and residence area-matched subjects with no history of obesity, hyperlipidaemia, hypertension, or diabetes mellitus were selected, and the data from 135 subjects were analyzed. Dietary data were collected using 24-h dietary recalls. Each participant was asked by a trained interviewer to provide the name and amount of all foods consumed. The daily intake of energy and nutrients was averaged over 7 days to estimate usual dietary intake, and the main nutrients of interest were energy, protein, total fat, and cholesterol, and specifically intake of vitamins and minerals. Blood samples were collected from each participant while in a seated position after fasting for at least 12 h. Levels of serum TG, total cholesterol (TC), HDL-c, low-density lipoprotein cholesterol (LDL-c), FBG, and uric acid (UA) were measured.

Statistical analysis

The data was entered manually into the SPSS Statistics, version 17.0 (IBM SPSS Inc., Chicago, IL). No imputation method was used to replace missing values and only completely filled questionnaires were included in the study.

RESULTS:

The patients with MetS had significantly higher blood pressure, BMI, and WC and higher levels of TG, TC, LDL-c, FBG, and UA but lower HDL-c levels than those in the control group. The patients with MetS were more likely to be smokers and had a lower education level. In regard to dietary nutrient intake status, intake of energy, total fat, cholesterol, and sodium were significantly higher and intake of vitamin E and magnesium were relatively deficient in the patients with MetS compared with the control group. There were no significant differences in gender, age, and physical activity level between the 2 groups.

Table 1: Basic characteristics and dietary nutrient intake of case and control subjects

Variable	Case subjects	Control subjects	P-value
	N = 123	N = 135	
	Frequency (%)	Frequency (%)	
Gender			0.90
Female	51 (41.4)	57 (42.2)	
Male	72 (58.5)	78 (57.8)	
Physical activity level			0.53
Heavy	15 (12.2)	21 (15.6)	
Moderate	50 (40.7)	59 (43.7)	
Light	58 (47.2)	55 (40.7)	
Smoking status			0.03
Current smoker	52 (42.3)	40 (29.6)	
Non-smoker	71 (57.7)	95 (70.4)	
	Mean ± Std Dev	Mean ± Std Dev	P-value²
Education level, years	14.4 (2.0)	15.3 (1.5)	<0.0001
Age, years	54.0 (10.4)	53.7 (9.7)	0.89
SBP, mmHg	144 (16.0)	118 (14.4)	<0.0001
DBP, mmHg	87 (9.3)	75 (9.5)	<0.0001
BMI, kg/m ²	28.2 (3.0)	23.3 (2.7)	<0.0001
WC, cm	88.0 (9.6)	81.2 (8.2)	<0.0001
TC, mmol/l	5.4 (1.1)	4.8 (0.8)	<0.0001
TG, mmol/l	2.7 (1.8)	1.1 (0.9)	<0.0001
HDL-c, mmol/l	1.3 (0.2)	1.4 (0.3)	<0.0001
Uric acid, µmol/l	341.1 (52.4)	306.7 (58.1)	<0.0001
Nutrients			
Energy, kcal	2198.4 (596.5)	1966.0 (305.3)	<0.0001
Protein, g	70.4 (20.5)	68.9 (14.5)	0.49
Total fat, g	81.5 (26.4)	71.8 (17.0)	<0.05
Cholesterol, mg	498.7 (267.3)	430.7 (215.5)	<0.05
Vitamin C, mg	101.9 (41.4)	106.0 (46.5)	0.58
Vitamin E, mg	27.5 (8.7)	29.9 (8.7)	<0.05
Calcium, mg	457.5 (207.3)	489.1 (178.1)	0.19
Iron, mg	23.0 (7.3)	23.3 (10.7)	0.82
Sodium, mg	3698.3 (868.2)	3377.6 (685.5)	<0.0001
Copper, mg	2.0 (1.6)	1.9 (0.6)	0.41

DISCUSSION:

The complex interactions among these nutrients might be related to MetS, which should be clarified in a future study. Our findings suggest that the “vitamin B group” pattern as a whole may be a more important factor that influences the prevalence of MetS than a single nutrient. These nutrients, together with MetS, may cooperatively mediate the beneficial association with the “vitamin B group” pattern. Vitamin B group are rich in nuts, millet, beans foods, and certain fruits (such as tangerines, peaches, and grapes) [8]. Although different vegetables have different B vitamin contents, dark-green vegetables, peppers, and cruciferous vegetables are generally good sources of B vitamins [7]. The priority of the modern diet should be low-processed cereal products that contain high levels

of B vitamins. Czaja et al. showed that the richest source of thiamine and niacin is wild rice [9]. Further, a long-term study is required to clarify the association between the vitamin B group pattern and MetS in the future.

Oxidative stress is invariably associated with MetS. Although epidemiological studies have demonstrated that vitamin C and vitamin E decrease the incidence of coronary heart disease, clinical trials have failed to support the beneficial effect of these antioxidants [10]. Meanwhile, as a part of vitamin A, retinol + retinyl esters had a positive relationship with IR, UA, and MetS [11]. Samara et al. showed that calcium levels were positively related to TG and negatively to HDL-c in women [55]. Our findings demonstrated that there

was no negative correlation between the antioxidant vitamins group and MetS, but this relationship must be confirmed in a future study [12].

CONCLUSION:

It is concluded that vitamin B group pattern was negatively associated with the risk of MetS. Our findings suggest that intake of B vitamins as a whole might be a simple and effective way to prevent or slow the development of MetS.

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