

Mediterranean dietary patterns and risk of type 2 diabetes in the Islamic Republic of Iran

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Abstract

Background: More than 1% of urban Iranians aged >20 years develop type 2 diabetes annually. A major contributing factor is overweight due to energy imbalance and poor quality diet. Even though there are reports on the beneficial effects of some isolated foods on glucose metabolism, researchers are increasingly focusing on dietary patterns versus single foods.

Aims: The aim of this study was to evaluate the association between adherence to a Mediterranean diet and risk of type 2 diabetes.

Methods: The current study was a case-control study nested in the cohort of the Tehran Glucose and Lipid Study. Among participants who met the study criteria, 187 incident cases of diabetes were identified and matched with 374 healthy controls according to sex, age, date of data collection, and previous history of lifestyle intervention.

Results: In the highest Mediterranean Diet Scale (MDS) category there were higher intakes of energy, fibre, glycaemic load, carbohydrate, total fat, and olive oil. However saturated fatty acid and monounsaturated fatty acid intakes decreased in higher MDS categories. The multiple adjusted odds ratios (ORs) for type 2 diabetes among individuals with medium (score 3–4) and high (score 5–8) adherence to MDS were 0.79 (95% CI:0.38–1.65) and 0.93 (95% CI:0.44–1.96), respectively, compared to individuals with low adherence (score 0–3).

Conclusion: Adherence to the Mediterranean dietary pattern was not associated with type 2 diabetes. Increased rates of type 2 diabetes in the Islamic Republic of Iran might be accounted for by the cultural and traditional differences between the Iranian and the Mediterranean dietary patterns.

Keywords: Mediterranean diet, diabetes, diet quality, Mediterranean Diet Score

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Introduction

Type 2 diabetes is a highly prevalent noncommunicable disease at a global level (1). Its prevalence is increasing across the globe, including in the Islamic Republic of Iran (2). The worldwide incidence is projected to rise from 171 million in 2000 to 366 million in 2030, imposing exorbitant costs on health care systems. This diabetes epidemic will continue even if obesity levels remain constant (1). In the Islamic Republic of Iran, more than 1% of the urban population aged over 20 years develops type 2 diabetes annually (2). Hyperglycaemia caused by diabetes can lead to dysfunction and failure of various organs, specifically nerves, kidneys, eyes, heart and blood vessels (3). The major cause of type 2 diabetes is overweight due to energy imbalance; poor diet quality also plays a role (4). Even though there are reports on the beneficial effects of some isolated foods or food groups on glucose metabolism, currently researchers are increasingly focusing on dietary patterns versus single foods, since there are some interactions between single foods and nutrients that can confound the association between nutrition and the disease (5).

The Mediterranean diet is native to the Mediterranean region, an area with low incidence of chronic diseases and high life expectancy, which has made this dietary pattern important for public health (6). There is evidence that a Mediterranean dietary pattern protects against coronary heart disease (7), and based on the analogy between coronary heart disease and diabetes, this diet has also been postulated as being effective for the prevention and treatment of type 2 diabetes (8). Its protective role could be due to its ability to prevent weight gain and also to it being a source of beneficial components such as polyphenols and monounsaturated fatty acids (MUFAs) (9,10).

Trichopoulou et al. invented a scale for measuring adherence to the Mediterranean diet and named it the Mediterranean Diet Scale (MDS) (11); the diet entails a high consumption of vegetables, fruits and nuts, cereals, legumes and fish. It has a high ratio of MUFAs and saturated fatty acids (SFAs), moderate alcohol use, moderate dairy consumption and low consumption of meat and meat products.

Several studies have investigated the role of adherence

to a Mediterranean diet on type 2 diabetes risk through a priori dietary scores (4,10,12–19). A recent systematic review of randomized controlled trial and cohort studies showed that greater adherence to a Mediterranean diet measured by a priori scores is associated with a significant reduction in the risk of type 2 diabetes (20). However not all studies assessed Mediterranean diet compliance using a uniform scale, and most were conducted in the United States of America and European countries (20). With respect to cultural variations in dietary habits and possible biological differences in metabolism among different ethnic groups, associations between diet and disease may differ across geographical populations and ethnic groups (19).

To the best of our knowledge, no study has yet carried out research on the associations between a priori-defined dietary quality indices and risk of type 2 diabetes in the Middle East and North Africa (MENA) region. Therefore, our main aim was to evaluate the association between the MDS and risk of type 2 diabetes in a nested case-control design study among a healthy adult population in the Islamic Republic of Iran.

Methods

Design and study population

This study was run within the framework of the Tehran Lipid and Glucose Study (TLGS), an ongoing urban population-based cohort study aimed at evaluating the risk factors of noncommunicable diseases and their prevention through healthy lifestyles (21). Study participants were 15 005 residents (aged 3–75 years) of district No. 13 in Tehran, selected from 3 different health care centres between March 1999 and December 2001. Demographic, clinical, lifestyle and dietary data is collected for the TLGS over 3-year periods. First, a cross-sectional study was conducted from 1999 to 2001, then prospective follow-up surveys, 2 (2002–2005), 3 (2006–2008) and 4 (2009–2011), were performed.

Our study was a nested case-control study in the third and fourth surveys of the TLGS. Our participants were male and female adults > 20 years for whom we had complete sociodemographic, clinical, lifestyle and dietary data. Cases were participants who were newly diagnosed with diabetes in the third (2006–2008) and fourth (2009–2011) surveys who had been free of diabetes in previous surveys. American Diabetes Association criteria for case determination were: fasting plasma glucose ≥ 126 mg/dL, 2 hours plasma glucose (2 h-PG) after conducting an oral glucose tolerance test (OGTT) ≥ 200 mg/dL, or current therapy for a definite diagnosis of diabetes (3). In total, 641 cases of incident diabetes were identified, of whom we had complete dietary data for 221. Those who were pregnant or lactating ($n = 1$), had over- or under-reported energy intake ($n = 17$), or had a history of cancer or cardiovascular diseases ($n = 16$) were excluded. In all, 187 new cases of diabetes remained for analysis. For each case, 2 controls of the same age, sex and date of data collection (± 6 months gap for data collection),

were selected from among the healthy population ($n = 374$) with the individual matching method. Criteria for control selection were: fasting plasma glucose < 100 mg/dL, OGTT < 140 mg/dL and absence of other exclusion criteria. Since one third of participants had gone through an educational lifestyle intervention programme, cases were also matched on the basis of intervention. The study protocol was approved by the ethics committee at the Research Institute for Endocrine Sciences of Shahid Beheshti University of Medical Sciences, and all participants provided written informed consent.

Dietary assessment

A semi-quantitative food frequency questionnaire, used to assess dietary intakes during the preceding year, was administered by expert interviewers who had performed nutritional assessment for at least 3–5 years, either in the TLGS or in countrywide food consumption survey projects. The validity and reliability of the questionnaire regarding dietary pattern has been reported in previous studies (22). The food frequency questionnaire consisted of 168 items (22–24) and contained typical foods with standard serving size commonly consumed by Iranians. Participants reported the intake of each food item in a day, week or month in the previous year. The reported frequency was converted to daily consumption for each food item. Portion sizes of consumed foods were then changed to grams using household measures. For measurement of nutrients in foods we used the USDA food composition table (25) and for those items that were absent in that database the Iranian Food composition table was used as an alternative (26).

Based on Trichopoulou et al. (11), we categorized food intakes into 8 major components: vegetables, legumes, fruits and nuts, cereal, fish, meat and poultry, dairy products and ratio of MUFA to SFA. For religious reasons, alcohol consumption is not usual or is probably underreported in the Iranian population, therefore we excluded the alcohol component. We used the sex-specific median of consumption as a cut-off for scoring. For beneficial components, i.e. vegetables, legumes, fruits and nuts, cereal, fish and the ratio of MUFA to SFA, participants scored 1 for being at or above the cut-off and 0 for being below it. For components anticipated to be detrimental, i.e. meat, poultry and dairy products, participants who had a consumption below the cut-off scored 1, and those whose consumption was at or above the cut-off scored 0. Thus, the final MDS scores ranged from 0 (minimal adherence) to 8 (maximal adherence). The score used by Trichopoulou et al. awarded points for potato intake (11), whereas ours did not. Since the consumption of potato is quite high in our population and it has a high glycaemic index, including potatoes in the vegetable group could lead to a false increase in the scores for this food group. The MDS values of the studied population were then split into 3 categories: low adherence (score 0–2), medium adherence (score 3–4) and high adherence (score 5–8) (11).

We also assessed the glycaemic load for each

participant: values assigned to individual food items were obtained from the Atkinson table using glucose as the reference (27). Serving size and carbohydrates available in each serving are presented in this table. We calculated the amount of available carbohydrate in each food item consumed by multiplying the available carbohydrate in each serving by the intake of that food item and divided by serving size. The glycaemic load for each item was then calculated according to Atkinson et al. by multiplying its glycaemic index by the available carbohydrate divided by 100 (27). The total glycaemic load for each person was then calculated by adding up the glycaemic load of all products with a carbohydrate content.

Other measurements

Participants were interviewed by qualified interviewers using pretested questionnaires to gather data on sociodemographics, anthropometrics, family history of diabetes, medical history, and smoking status. This was carried out during the third and fourth surveys of the TLGS, according to which survey the respondent participated in.

Height and weight were measured with light clothes and shoes removed according to the standard protocol, then body mass index (BMI) was calculated. Waist circumference (WC) was measured at the level of the umbilicus over light clothing (21). Blood pressure was also measured using a standardized mercury sphygmomanometer on the right arm while sitting. The mean of 2 measurements was considered the participant's blood pressure. Physical activity during the preceding year was determined using the Modifiable Activity Questionnaire and calculating metabolic equivalent task (MET) minutes per week. The reliability and validity for the Farsi version of the questionnaire has been confirmed previously (28). The MET value of the activity was multiplied by the duration of each of the activities and all MET-minute products were summed to reach an estimate of daily physical activity, indicating energy expenditure per kilogram body weight during an average day. Levels of physical activity were then categorized as light (MET < 600 min/week), moderate (MET = 600–1499 min/week), and vigorous (MET ≥ 1500 min/week).

An overnight fasting blood sample was drawn from each participant for biochemical measurements. In addition to measuring fasting plasma glucose, another blood sample was obtained 120 minutes after the ingestion of 82.5 g glucose monohydrate solution, equivalent to 75 g hydrous glucose, for the OGTT. Glucose was assayed by an enzymatic colorimetric method (glucose oxidase technique) utilizing glucose kits (Pars Azmun Inc., Tehran). Total cholesterol concentrations were measured with cholesterol esterase and cholesterol oxidase using an enzymatic colorimetric method. The analysis of samples was performed using a Selectra 2 auto-analyser (Vital Scientific, Spankeren) (21).

Definition

Type 2 diabetes was defined as fasting plasma glucose ≥ 126 mg/dL, 2 h-PG after OGTT ≥ 200 mg/dL, or receiv-

ing current therapy for a definite diagnosis of diabetes, according to the American Diabetes Association criteria (3). Hypertension was determined if systolic blood pressure was ≥ 140 mmHg, diastolic blood pressure was ≥ 90 mmHg, or the person was under current treatment with antihypertensive medications, either at the time of interview or in the previous month, according to the JNC-VIII criteria (29). Hypercholesterolaemia was defined as plasma cholesterol > 200 mg/dL, according to NCEP-ATP III (30). Energy intake reports over 3500 kcal/day in women or 4200 kcal/day in men were considered over-reporting and energy intake reports under 500 kcal/day in women or 800 kcal/day in men were considered under-reporting (31).

Statistical analysis

We matched each case with 2 healthy controls according to age, sex, date of data collection and existence of lifestyle intervention, using an individual matching method. Means and standard deviations, or proportions of potential diabetes risk factors were determined at baseline in cases and controls. The *t*-test and Chi-squared test were used to compare means and proportions for the case and control groups; *P* for trend was calculated by assigning the median value for each category of MDS treated as a continuous variable using linear (for continuous variables) or binary logistic (for dichotomous variables) regression. Conditional logistic regression models were used to estimate the OR and the 95% confidence interval (95% CI) in each quartile. We used SPSS, version 17.0, and STATA, version 13.0, for statistical analysis. *P*-values < 0.05 were considered statistically significant. Model 1 was adjusted for family history of diabetes, BMI, education level, smoking status, physical activity and total energy intake; model 2 was further adjusted for WC, hypercholesterolaemia and hypertension.

Results

Mean BMI and WC were significantly higher in the case group than the control group (Table 1). Cases were significantly more likely to be hypertensive and hypercholesterolaemic than controls. We compared glycaemic load, total fibre, trans-fatty acids (TFAs), MUFAs, PUFAs between cases and controls. Furthermore, we compared MDS and its components between the 2 groups. After performing the *t*-test, none of them differed significantly except the MUFA to PUFA ratio (Table 1).

Table 2 presents some demographic and lifestyle variables and some dietary factors. Study participants in the highest MDS category were slightly older compared to the lowest one. Energy, fibre, glycaemic load, carbohydrate, and total fat intake were also higher in the highest MDS category. The proportion of both SFA and MUFA decreased with higher MDS category; however intakes of olive oil showed an upward trend.

The associations between MDS and type 2 diabetes are presented in Table 3. Compared to the lowest, the risk of type 2 diabetes in the highest category of MDS was

Table 1 Distribution of demographic and dietary characteristics among cases with incident type 2 diabetes and their matched controls (2006–2008 and 2009–2011 Tehran Lipid and Glucose Study surveys)

Characteristic	Cases (n = 187)		Controls (n = 374)		P-value
	Mean	SD	Mean	SD	
Age (years)	51.0	13.0	50.8	12.7	0.871
Body mass index (kg/m ²)	30.8	5.7	28.4	4.9	< 0.001
Waist circumference (cm)	101.2	12.4	94.7	11.9	< 0.001
Total fibre (g)	46.5	32.5	44.0	21.6	0.343
Glycaemic load	158.0	68.1	158.0	8.4	0.997
TFA (% of energy)	0.69	0.66	0.73	0.62	0.526
MUFA (% of energy)	25.5	11.5	25.2	10.3	0.219
PUFA (% of energy)	16.1	9.8	15.3	7.0	0.061
MDS score	4.04	1.53	4.02	1.49	0.874
Vegetables (g/day)	312	186	318	184	0.535
Legumes (g/day)	34	32	36	38	0.130
Fruits and nuts (g/day)	423	346	448	376	0.531
Cereals (g/day)	431	204	415	186	0.213
Fish (g/day)	10	12	11	15	0.196
Meat and poultry (g/day)	48	35	48	43	0.880
Dairy (g/day)	399	251	418	257	0.658
MUFA to SFA ratio	1.1	0.29	1.0	0.25	0.013
		%		%	
Male (%)		42.8		42.2	0.904
Smoking (%)					
Non-smoker		81.8		79.1	0.560
Past smoker		7.5		7.0	
Smoker		10.7		13.9	
Education (%)					
Primary and under		21.9		24.9	0.558
Guidance school		13.9		15.5	
High school		50.3		43.9	
University		13.9		15.8	
Hypertension (%)		44.9		29.1	< 0.001
Hypercholesterolaemia (%)		57.2		42.8	0.002

SD = standard deviation; TFA = trans-fatty acid; MUFA = monounsaturated fatty acid; PUFA = polyunsaturated fatty acid; MDS = Mediterranean Diet Scale; SFA = saturated fatty acid.

0.95 (95% CI: 0.56, 1.61) in the crude model. When adjusted for known confounding factors including family history of diabetes, BMI, physical activity, education level, smoking status, and total energy intake (Model 1), the OR was lower but it was still not statistically significant (OR: 0.87, 95% CI: 0.43, 1.75). Further adjustment for WC, hypercholesterolaemia, and hypertension attenuated the association (OR: 0.93, 95% CI: 0.44, 1.96). None of the models showed significant association between MDS adherence and the risk of type 2 diabetes.

In a further analysis, we entered all 8 components of the score in the logistic regression separately. None of the components showed a significant relationship with diabetes risk except for the MUFA to SFA ratio, which

was associated with a 2-fold increase in diabetes risk only in the crude model (data not shown).

Discussion

In this case-control study nested in a large cohort, adherence to a Mediterranean diet, assessed by an a priori dietary score was not associated with type 2 diabetes in adult men and women of an urban Iranian population.

Our results are in line with 2 previous prospective studies: the Multi-Ethnic Study of Atherosclerosis (MESA), which was conducted on different ethnicities, and the Whitehall II study, which found no significant association between MDS and incidence of type 2

Table 2 Distribution of baseline characteristics and selected dietary factors according to the three categories of the Mediterranean diet scale (MDS)

Characteristic	MDS score			P for trend ^a			
	Low (0–2)	Moderate (3–4)	High (5–8)				
Male (%)	45.6	42.3	41.2	0.489			
Family history of diabetes (%)	50.0	40.0	38.4	0.933			
	Mean	SD	Mean	SD	Mean	SD	
Age (years)	48.1	12.9	50.1	12.6	52.8	12.7	0.033
Body mass index (kg/m ²)	29.0	5.7	29.3	5.3	29.1	5.2	0.852
Waist circumference (cm)	96.5	14.0	97.3	11.7	96.3	12.5	0.856
Physical activity (MET/min/week)	531	732	569	828	646	749	0.809
Total energy intake (kcal)	1942	585	2165	709	2504	664	< 0.0001
Total fibre (g)	30.3	13.8	41.7	27.8	55.0	23.1	< 0.0001
Glycaemic load	129.0	44.1	151	60.5	179	62.9	< 0.0001
Whole grains (g)	36.8	65.8	43.9	63.4	79.1	105.0	< 0.0001
Protein (%)	14.6	3.2	15.1	6.4	14.6	2.5	0.685
Carbohydrate (% of energy)	55.0	6.6	57.8	7.2	61.0	6.7	< 0.0001
Fat (% of energy)	32.8	6.3	30.7	7.0	28.5	5.9	< 0.0001
Saturated fatty acid (% of energy)	12.1	3.0	10.1	2.7	8.5	2.2	< 0.0001
Trans-fatty acid (% of energy)	0.7	0.6	0.8	0.7	0.7	0.6	0.887
Monounsaturated fatty acid (% of energy)	10.8	2.5	10.4	3.1	9.6	2.6	0.017
Polyunsaturated fatty acid (% of energy)	6.1	2.1	6.3	2.2	6.3	2.5	0.031
Olive oil (g/day)	0.8	1.8	0.9	1.9	1.7	2.9	0.003

= standard deviation; MET = metabolic equivalent task.

^aLinear regression was used for continuous variables and logistic regression for categorical variables by assigning the median value for each category of MDS treated as a continuous variable

diabetes (16,32). Similarly, in a previous study of the TLGS, no association was observed between MDS adherence and metabolic syndrome (33). Contrary to our findings, some prospective studies have documented inverse associations between Mediterranean dietary pattern and the incidence of type 2 diabetes (4,10,14,15,17–19). Martinez-Gonzalez et al. reported an 83% decrease in incidence of type 2 diabetes among a Spanish population with high adherence to Mediterranean diet, assessed by original MDS score (10). In other studies including the Health Professionals Follow-Up study (HPFS), the Nurses’ Health Study II (NHS II), the European Prospective Investigation into Cancer and Nutrition (EPIC), and the Multi-Ethnic

Cohort (MEC) study, high adherence to Mediterranean diet assessed by a priori diet scores reduced the incidence of type 2 diabetes by 12–28% (4,15,19). Varying results can indicate that the Mediterranean diet may not have the same effect on different populations (20).

The controversial findings can largely be attributed to the region where the Mediterranean diet was scored and the type of score used. For instance, the association was stronger in countries such as Spain and Italy compared to others (10,12). According to Hoffman and Gerber, the effect of each component of the Mediterranean diet score on health can differ in different populations

Table 3 Conditional logistic regression for association between type 2 diabetes and the Mediterranean diet scale (MDS)

Model	MDS score				
	Low (0–2) (n = 90)	Moderate (3–4) (n = 260)	High (5–8) (n = 211)		
	OR	OR	95% CI	OR	95% CI
Crude model	1 (reference)	0.82	0.49–1.38	0.95	0.56–1.61
Model 1	1 (reference)	0.77	0.38–1.54	0.87	0.43–1.75
Model 2	1 (reference)	0.79	0.38–1.65	0.93	0.44–1.96

OR = odds ratio; CI = confidence interval.

Model 1: conditional analysis matched on age, sex, and date of data collection and controlled for family history of diabetes, body mass index, educational level, smoking status, physical activity, and total energy intake.

Model 2: multiple adjusted model, additionally adjusted for waist circumference, hypercholesterolaemia, and hypertension.

(34) due to disparities between the Mediterranean and non-Mediterranean countries in food availability, priority given to specific foods in each food group, and processing and preparation of foods all of which affect the overall health benefits of the Mediterranean diet in non-Mediterranean countries (34). In addition, it seems that the protective effect of the Mediterranean diet against chronic diseases relates to dietary behaviours such as the order of meals, the time of eating each meal and the meal patterns or other potentially confounders such as genetics, sleeping and sunlight exposure (34,35). On the other hand, most of the studies used a modified MDS instead of the original one (4,12,14–16,32), which could result in differences in prediction of disease risk between studies.

One of the components of MDS known to be beneficial is cereal consumption, regardless of glycaemic load, amount of fibre or degree of processing. Both refined and unrefined cereals get positive points (36). According to Biesalski et al., high fibre dietary carbohydrates may lead to a lower risk for diabetes among a healthy population (37). Also, it has been shown that a diet with low glycaemic load and a high MDS can effectively reduce the incidence of type 2 diabetes whereas a high glycaemic load, high MDS diet showed no significant relationship with type 2 diabetes (17). Iranians have high intakes of grains as the main source of energy, but most grains are of the refined type (loaded with white rice and bread) (38), in the traditional Mediterranean diet, cereals were largely unrefined (11). Therefore cereal consumption, regardless of its quality (refined or unrefined) might be a factor in part for the lack of association between MDS and type 2 diabetes in our study.

Based on a review of data on dietary fat and diabetes, replacing SFA and TFA with unsaturated fatty acids (PUFA and/or MUFA) can enhance insulin sensitivity and is likely to protect against type 2 diabetes (39). This is in contrast with our findings where MUFA to SFA ratio was related to an increase in diabetes risk; this finding was not significant when we adjusted for confounding factors though. On the other hand, an outstanding feature of the original Mediterranean diet is the abundant use of olive oil, containing a high ratio of MUFA to SFA beside its antioxidant properties, which may play role in preventing chronic diseases (34). The mean total intake of olive oil in our sample (1.1 g in both sexes; data not shown) was much lower than the Greek sample (45.5 in men and 38.7 in women) in Trichopoulou's study (11).

According to Hoffman and Gerber (34) the main source of MUFA intake in non-Mediterranean populations is animal fat rather than olive oil. This was confirmed in our study where olive oil consumption rose across categories of MDS, whereas MUFA intake declined. So the ratio of MUFA to SFA is not that highly affected by olive oil in our population and thus cannot be a predictor of diabetes risk.

In all diets, there are particular issues that cannot be seen in any comparisons. For instance, in our population daily median intake of fish was lower than that in the Greek population for which the MDS was originally designed (7.08 vs 23.7 g/day for men; 6.37 vs 18.8 g/day for women) (11). Besides the difference in quantity of fish consumed, the quality varies a great deal since the different methods of cooking affect the fatty acid content and the types of fish consumed also differ in the Islamic Republic of Iran and the Mediterranean countries (34). Red wine is another feature of the Mediterranean diet (37). Moderate alcohol consumption is hypothesized to have an enhancing effect on insulin sensitivity and thus to reduce the risk of diabetes (9).

One of the limitations of our study is the small sample size and case-control rather than prospective design, which is prone to reverse causality; however the nested case-control design allowed us to use only new cases of diabetes that were not diabetic or even pre-diabetic in past surveys of the cohort, so the risk of reverse causality is minimized substantially. Second, our study tried to draw a Mediterranean dietary pattern from usual diets of the participants, which may have led to imprecision of defining the Mediterranean diet. Last, but not least, due to the small sample size, subgroup analyses were not possible in our study.

There were several strengths to our study. This was the first study investigating the association between the Mediterranean dietary pattern, assessed by an a priori method, and type 2 diabetes among the MENA population. Precise case selection and use of objectively-identified diabetes (not self-reported per se), and the highly standardized serum processing, anthropometric measurements, and covariate assessment are among the other strengths.

In conclusion, we found no inverse association between the Mediterranean dietary pattern measured by MDS and type 2 diabetes, in this healthy adult Iranian population sample. The Iranian dietary pattern does not correspond closely to the Mediterranean dietary pattern, which might be responsible for the lack of significant association. Further large scale, prospective studies, especially in Asian and Middle Eastern populations, with modifications in the scoring to become more compliant with usual diets of the population, are needed to investigate the applicability of the Mediterranean dietary pattern to type 2 diabetes prevention.

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Competing interests: None declared.

Habitudes alimentaires méditerranéennes et risque de diabète de type 2 en République islamique d'Iran

Résumé

Contexte : Plus d'un pour cent (1 %) des Iraniens âgés de 20 ans et plus vivant en zones urbaines développent un diabète de type 2 chaque année. Le surpoids causé par le déséquilibre énergétique et l'alimentation de mauvaise qualité constitue l'un des principaux facteurs du diabète. Même s'il existe des rapports sur les effets bénéfiques de certains aliments isolés sur le métabolisme du glucose, les chercheurs se concentrent actuellement de plus en plus sur les habitudes alimentaires plutôt que sur la consommation d'aliments simples.

Objectif : L'objectif de la présente étude était d'évaluer l'association entre l'adhésion à un régime méditerranéen et le risque de développer un diabète de type 2.

Méthodes : La présente étude est une étude cas-témoins nichée dans la cohorte de l'étude de Téhéran sur le glucose et les lipides. Parmi les participants qui répondaient aux critères de l'étude, 187 cas incidents de diabète ont été identifiés et appariés avec 374 témoins en bonne santé en fonction du sexe, de l'âge, de la date de la collecte des données et des précédentes interventions liées au mode de vie.

Résultats : La catégorie la plus élevée de l'échelle du régime méditerranéen était caractérisée par des apports en énergie, en fibres et en glucides élevés, un apport total en graisses élevé, une forte charge glycémique et une consommation importante d'huile d'olive, ainsi que par des apports en acides gras saturés et en acides gras monoinsaturés moins élevés. Les multiples odds ratio ajustés pour le diabète de type 2 chez les personnes présentant une adhésion moyenne (score 3-4) et élevée (score 5-8) à l'échelle du régime méditerranéen étaient de 0,79 (IC à 95 % : 0,38-1,65) et 0,93 (IC à 95 % : 0,44-1,96), respectivement, comparativement aux personnes présentant une faible adhésion (score 0-3).

Conclusion : L'adhésion au régime alimentaire méditerranéen n'était pas associée au diabète de type 2. L'augmentation des taux de diabète de type 2 en République islamique d'Iran pourrait être imputable aux différences culturelles et traditionnelles entre les régimes alimentaires iranien et méditerranéen.

الأنماط الغذائية في منطقة البحر المتوسط وخطر الإصابة بالنمط الثاني من داء السكري في جمهورية إيران الإسلامية

مرجان رمضان، كلاله أصغري، بروين ميرميران، زاله طهاسبي نجاد، فريدون عزيزي

الخلاصة

الخلفية: يُصاب بالنمط الثاني من داء السكري سنوياً أكثر من 1٪ من الإيرانيين الذين يعيشون في مناطق حضرية وتزيد سنهم على 20 عاماً. ومن العوامل الرئيسية المساهمة في ذلك زيادة الوزن بسبب اختلال الطاقة ورداءة جودة النظام الغذائي. وعلى الرغم من وجود تقارير بأن بعض الأغذية لها تأثيرات مفيدة على استقلاب الجلوكوز، يزداد حالياً تركيز الباحثين على الأنماط الغذائية بدلا من التركيز على أغذية بعينها.

الأهداف: هدفت هذه الدراسة إلى تقييم العلاقة بين الالتزام بنظام غذائي متوسطي وخطر الإصابة بالنمط الثاني من داء السكري.

طرق البحث: كانت هذه الدراسة إحدى دراسات الحالات والشواهد الموجودة ضمن الدراسة الأترابية المعنونة "دراسة الجلوكوز والدهون في طهران". ومن بين المشاركين الذين استوفوا معايير الدراسة، حُدثت 187 حالة إصابة بداء السكري، وطوبقت مع 374 حالة شاهدة سليمة وفقاً للجنس والسن وتاريخ جمع البيانات وسوابق تدخلات أنماط الحياة.

النتائج: في أعلى فئة من فئات "مقياس النظم الغذائية المتوسطة" (MDS)، كانت هناك أغذية ذات قدر أكبر من الطاقة والألياف والحمل الجلايسيمي والكربوهيدرات وإجمالي الدهون وزيت الزيتون. ومع ذلك، انخفضت كمية الأحماض الدهنية المشبعة والأحماض الدهنية أحادية الإشباع في الفئات العليا. وأما نسب الأرجحية المتعددة المصححة للنمط الثاني من داء السكري لدى أشخاص يلتزمون بالنظام الغذائي المتوسطي التزاماً متوسطاً (من 3 إلى 4 درجات) ومرتفعاً (من 5 إلى 8 درجات) فكانت [aOR = 0,79; 95% CI = 0,38, 1,65] و [aOR = 0,93; 95% CI = 0,44, 1,96]، على التوالي، مقارنةً بالأشخاص ذوي الالتزام المنخفض (من 0 إلى 3 درجات).

الاستنتاج: لم يكن الالتزام بالنظام الغذائي المتوسطي مرتبطاً بالنمط الثاني من داء السكري، وهو ما يمكن عزوه إلى الاختلافات الثقافية والتقليدية بين أنماط الغذاء الإيرانية والمتوسطية.

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