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Original article

Link between Mediterranean diet and risk factors for acute coronary syndrome

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Abstract. *Background and aim:* Few studies have investigated its potential in secondary prevention of cardiovascular diseases (CVDs) and the possibility of alleviating the course and consequences of disease in a population fed according to Mediterranean diet (MD) principles. To evaluate the level of adherence to the MD in patients with acute coronary syndrome (ACS) and in individuals at risk for developing CVDs using a validated MedDiet score, to investigate whether the MD can play a protective role in the occurrence and severity of ACS. *Methods:* The study examined 294 subjects, evenly split by gender, between the ages of 30 and 82, using an analytical cross-sectional method. Among all participants in the study the following examinations were conducted: anthropometric measurements, arterial blood pressure measurements, appropriate biochemical analysis, ECG and surveys using a specially prepared questionnaire, which included MedDiet score – validated score system for assessing the degree of compliance with MD pattern among subjects. *Results:* The study found that the mean MedDiet score of participants without ACS was significantly higher than that of participants with ACS (27.48 and 20.53 respectively, p=0.029). The MedDiet score was determined as an excellent marker for ACS with a cut-off value of 22.5, with a score of 22.5 or lower considered as an unfavorable result, and a score above 22.5 considered as a favorable result. The MedDiet score was found to have a negative correlation with systolic blood pressure, blood glucose values, serum triglyceride values and cardiac necrosis biomarker, and a weak positive correlation with serum HDL values, atherosclerosis index. *Conclusions:* Mediterranean diet has a protective effect on the incidence and severity of acute coronary syndrome in patients who are already ill and in those at a higher risk of developing cardiovascular disease.

Key words: cardiovascular diseases, improper nutrition, mediterranean diet, acute coronary syndrome, MedDiet score, coronary artery disease, coronary heart disease

Introduction

Cardiovascular diseases (CVD) are a major public health issue, leading in both morbidity and mortality worldwide (1,2). Improper nutrition is a significant contributor to the development of chronic diseases such as diabetes, CVD, and cancer, putting a heavy burden on global healthcare systems (3,4). Unhealthy dietary habits, like high intake of sodium, processed foods, added sugars, unhealthy fats, and low intake of fruits, vegetables, whole grains, fiber, legumes, fish, and nuts, as well as a lack of physical activity, being overweight or obese, stress, alcohol consumption, or smoking, increase the risk of developing wide range of CVD, including coronary heart disease (CHD) (3,5-7). Numerous studies suggest that the Mediterranean diet (MD) is associated with a reduction in the risk of non-communicable diseases, as well as a reduction in the overall mortality rate (8-10). Since the middle of the 20th century, numerous studies have suggested that adherence to the MD is also associated with a reduction in the risk of developing CVD, including CHD a reduction in cancer rates, and even overall mortality among the population of the Mediterranean region (11). The MD represents the eating habits of the populations of Greece, Southern Italy, and Spain from the period of the 1940s and 1950s (12). The main aspects of the MD include a high consumption of olive oil, legumes, unrefined cereals, fruits, and vegetables, moderate to high consumption of fish, moderate consumption of dairy products, mainly cheese, and fermented dairy products, moderate consumption of wine, and limited consumption of meat. On the one hand, it represents a diet that has numerous health benefits, and on the other, a sustainable way of eating that is also applicable to non-Mediterranean areas (13,14). When compared to other dietary patterns, the Mediterranean diet shows greater health benefits both in the field of primary and secondary prevention even when compared, for example, to a diet with reduced fat content (15). The cardioprotective effects of the MD, especially in the field of primary prevention of CHD, have been well documented (16,17). However, significantly fewer studies address the secondary prevention of CHD and the possibility of alleviating the course and consequences of disease in a population fed according to MD principles (6,18,19).

The purpose of this study was to evaluate the level of adherence to the MD in patients with acute coronary syndrome (ACS) and in individuals at risk for developing CHD using a validated Mediterranean diet score, the MedDiet score (20). The reason for selecting subjects with ACS and those at increased risk of developing CHD is to investigate whether the MD can play a protective role in the occurrence and severity of ACS in already ill patients and in those at risk of developing CHD.

Methods

Study design

The research was conducted as a cross-sectional analytical study, where data were consecutively collected for two specifically chosen groups of respondents. The total number of adult respondents included in the study was n=294 (146 women and 148 men), ranging in age from 30 to 82 years. The research was conducted between September 2018, and March 2022. The first group consisted of patients hospitalized at the Institute of Cardiovascular Diseases in Vojvodina, Sremska Kamenica, Serbia who had been diagnosed with ACS. The second group consisted of individuals who had at least one risk factor for CHD but did not have clinically manifested coronary disease.

Considering the existing literature data on the mean value of the MedDiet score for the mentioned subject groups (population with ACS and population with at least one risk factor for CVD development, without clinically manifest coronary artery disease) along with the standard deviation, a sample size estimation was performed. With a test power of 0.8 and α=0.05, a minimum sample size of 140 subjects per defined group, totaling 280 subjects, was determined.

The collected data included demographic information, anthropometric measurements, clinical characteristics, blood test results, 12-lead electrocardiography (ECG). The study used the European Society of Cardiology guidelines to diagnose ACS (21,22). Participants who had made significant changes to their diet or lifestyle in the previous 6 months, were on a weight loss program, or were pregnant or nursing were excluded. Additionally, in the group without ACS, individuals with a pathological Q wave, significant ST segment elevation or depression, inverted T wave, or ventricular extrasystoles on their ECG were also excluded (23).

Nutritional habits assessment and MedDiet score

Habitual diet was assessed at baseline with a previously validated semiquantitative 136-item food-frequency questionnaire, administered by trained personel (24). The questionnaire assessed their usual dietary intake over the preceding year, including 136 commonly consumed foods and beverages. Adherence to the MD was determined using the MedDiet score, which evaluated consumption of 9 food groups on a weekly basis: non-refined cereals, fruit, vegetables, legumes, potatoes, fish, meat and meat products, poultry, full-fat dairy products, olive oil, and alcohol. With the exception of alcohol, the frequency of consumption of certain foods was scored using monotonic functions. Foods consistent with the MD pattern (non-refined cereals, fruits, vegetables, legumes, olive oil, fish and potatoes) were scored from 0 to 5, with 0 for no consumption and 5 for daily consumption in certain amounts. Foods considered to be inconsistent with the MD pattern (meat and meat products, poultry and full-fat dairy products) were scored on a reverse scale, from 5 for no consumption to 0 for almost daily consumption. Alcohol consumption was scored 5 for less than 300 ml per day, 0 for no consumption or more than 700 ml per day and 4 to 1 for consumption of 600-700, 500-600, 400-500 and 300-400 ml per day, respectively. The final score ranges from 0 to 55, with higher scores indicating greater compliance to the MD and lower scores indicating a "Western-style" diet (20).

Ethics

The study received ethical approval from the Institute of Public Health of Vojvodina (Registration no. 01-2220/3-2015) and the Institute of Cardiovascular Diseases of Vojvodina (Registration no. 153/1-7) and all participants gave written informed consent to participate. The study was conducted in accordance with Good Clinical Practice and in accordance with the Declaration of Helsinki.

Statistics

The statistical data analysis included: descriptive statistics such as arithmetic mean ($\bar{x}$), standard deviation (SD), median (MD), quartiles, frequencies (n) and percentages (%). Normality of the distribution of numerical variables was determined using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The t-test for independent samples and the Mann-Whitney test were used to compare the mean values of variables between the two groups of subjects. The association of categorical variables was examined using the Chi-square test and Fisher's test. The potential of observed parameters to serve as markers for ACS was examined using ROC curves, where the threshold value (Cut-off) was defined as the point that maximizes the product of sensitivity and specificity. Correlation between continuous variables was measured by calculating the Pearson correlation coefficient and the Spearman correlation coefficient. The relationship between dietary habits and ACS as well as risk factors for CHD was examined using regression analysis. Statistical significance for all of the tests was set at the p value of <0.05. All of the analyses were performed in SPSS version 20.0 (IBM SPSS Statistics, New York, NY, USA).

Results

The main clinical and demographic findings are presented in Table 1.

The mean MedDiet score of participants without ACS was 27.48 ± 6.59, with a minimum score of 12 and a maximum of 43. The mean MedDiet score of participants with ACS was 20.53 ± 4.01, with a minimum of 13 and a maximum of 36. The difference in mean MedDiet scores between participants with and without ACS was found to be statistically significant ($p=0.029$), with the participants in no-ACS group having an average 25% higher MedDiet score (Table 1).

The ability of the examined variables to predict an unfavorable outcome, i.e. the occurrence of ACS, was evaluated using receiver operating characteristic (ROC) curves, which determined the optimal cut-off point for sensitivity and specificity of the corresponding variable. All potentially relevant risk factors were considered during the analysis, but only the relevant factors are shown in the results. The results showed that the MedDiet score was an excellent marker for ACS (AUROC = 0.815, $p<0.0005$). The cut-off value was 22.5, with a sensitivity of 0.773 and a specificity of 0.778 (Figure 1).

The cut-off value for the MedDiet score was determined as 22.5, with a score of 22.5 or lower considered as a positive (unfavorable) result, and a score above 22.5 considered as a negative (favorable) result. Mean values of the variables were then observed for the two groups of participants based on this cut-off value (Table 2).The mean systolic pressure was significantly higher in the positive MedDiet score group (144.44±22.54 mmHg) compared to the negative MedDiet score group (133.66±21.56 mmHg) ($p<0.0005$).

Table 1. Demographic and clinical characteristics of participants.

	Overall (n=294) x̄ ±SD (min-max)	ACS (n=141) x̄ ±SD (min-max)	Non ACS (n=153) x̄ ±SD (min-max)	p Value
Age	59.16 ±11.32 (30-86)	61.53±9.75 (34-86)	56.97±12.23 (30-82)	**<0.0005***
Height (cm)	169.78±9.96 (148-196)	171.35±9.16 (150-196)	168.34±10.46 (148-192)	**0.009***
Weight (kg)	85.78±18.16 (48-167)	83.6±15.26 (50-140)	87.79±20.33 (48-167)	0.145
BMI	29.73±5.58 (18.30-49.30)	28.41±4.39 (20.96-46.06)	30.93±6.27 (18.30-49.30)	**<0.0005***
SBP (mmHg)	138.9±22.66 (100-230)	145.67±24.17 (100-230)	132.66±19.23 (100-220)	**<0.0005***
DBP (mmHg)	84.53±12.24 (55-140)	85.25±13.61 (60-140)	83.88±10.84 (55-120)	0.342
Glucose level (mmol/L)	7.46±3.04 (3.70-25)	8.96±3.39 (4.16-25)	6.07±1.81 (3.7-17.50)	**<0.0005***
Cholesterol (mmol/L)	5.65±1.27 (2.24-9.30)	5.49±1.44 (2.24-9.30)	5.83±1.07 (3.60-9.30)	**0.016***
Triglycerides (mmol/L)	1.88±0.92 (0.22-6.03)	1.91±0.85 (0.22-5.10)	1.86±0.99 (0.47-6.03)	0.6
HDL (mmol/L)	1.27±0.6 (0.36-5.53)	1.15±0.46 (0.36-3.2)	1.38±0.7 (0.41-5.53)	**0.001***
LDL (mmol/L)	3.53±1.25 (0.34-7.69)	3.45±1.38 (0.34-7.69)	3.6±1.11 (1.00-7.42)	0.321
Atherosclerosis Index	3.35±1.9 (0.23-10.98)	3.6±2.23 (0.23-10.98)	3.11±1.51 (0.27-10.98)	0.274
Ischemic heart disease risk	5.14±2.18 (1.42-12.69)	5.46±2.5 (1.52-12.69)	4.84v1.79 (1.42-12.51)	0.19
MedDiet score	24.15±6.5 (12-43)	20.53±4.01 (13-36)	27.48±6.59 (12-43)	**0.029***

BMI - body mass index, SBP - systolic blood pressure, DBP - diastolic blood pressure, HDL – (High Density Lipoprotein), LDL - (Low-Density Lipoprotein), Atherosclerosis Index (LDL holesterol/HDL holesterol), Ischemic heart disease risk (Holesterol/HDL holesterol)* p<0.05.

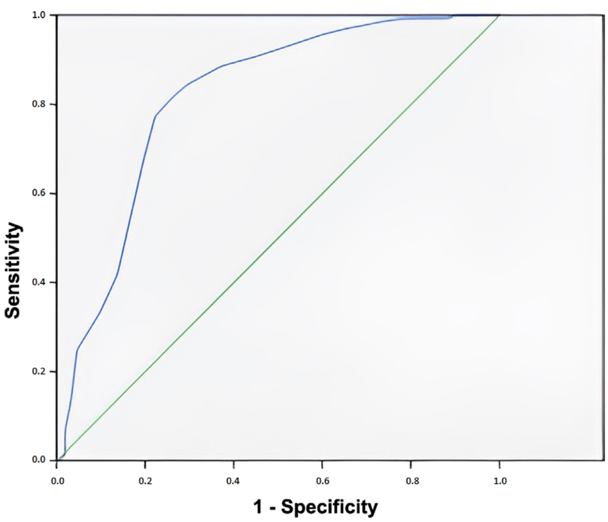

Figure 1. ROC curve for evaluating the MedDiet score as a predictor of ACS occurence.

The positive MedDiet score group exhibited a significantly higher mean fasting glucose level (8.27±2.88 mmol/L) compared to the negative MedDiet score group (6.68±3.00 mmol/L) ($p<0.0005$). Participants in the positive MedDiet score group had significantly higher mean serum HDL cholesterol levels (1.45±0.51 mmol/L) compared to those in the negative MedDiet score group (1.39±0.66 mmol/L) ($p=0.001$). The positive MedDiet score group displayed a significantly higher mean atherosclerosis index (3.68±2.04) compared to the negative MedDiet score group (3.02±1.71) ($p=0.003$). The mean ischemic heart disease risk was significantly higher in the positive MedDiet score group (5.59±2.31) compared to the negative MedDiet score group (4.7±1.96) ($p<0.0005$).

The MedDiet score was found to have a negative correlation with systolic blood pressure ($r = -0.263$, $p < 0.0005$) (Table 3.). There is a clear trend of participants without ACS having lower values of systolic blood pressure and higher values of the MedDiet score. The MedDiet score also had a negative correlation with blood glucose levels ($r = -0.419$, $p < 0.0005$). It had a weak negative correlation with serum triglyceride

Table 2. Clinical characteristics of participants according toMedDiet score classification.

	MedDiet > 22.5 (n=151) $\overline{x}$ ±SD (min-max)	MedDiet ≤ 22.5 (n=143) $\overline{x}$ ±SD (min-max)	p Value
BMI	29.4±5.23 (18.3-36.7)	30.07±5.93 (19.4-49.3)	0.305
SBP (mmHg)	133.66±21.56 (100-180)	144.44±22.54 (110-230)	**<0.0005***
DBP (mmHg)	83.86±13.02 (55-120)	82.25±11.37 (60-140)	0.334
Fasting glucose level (mmol/l)	6.69±3.00 (3.7-18.3)	8.27±2.88 (4.4-25.0)	**<0.0005***
Cholesterol (mmol/l)	5.69±1.10 (2.24-7.61)	5.61±1.43 (3.16-9.30)	0.602
Triglycerides (mmol/l)	1.79±0.91 (0.22-4.85)	1.99±0.94 (0.67-6.33)	0.069
HDL (mmol/l)	1.39±0.66 (0.62-5.53)	1.15±0.51 (0.36-2.28)	**0,001***
LDL (mmol/l)	3.49±1.11 (0.34-4.66)	3.57±1.38 (0.48-7.69)	0.559
Atherosclerosis index	3.02±1.71 (0.23 -7.94)	3.68±2.04 (0.79-10.98)	**0.003***
Ischemic heart disease risk	4.71±1.96 (1.42-9.92)	5.59 ±2.31 (2.84-12.69)	**<0.0005***

BMI - body mass index, SBP - systolic blood pressure, DBP - diastolic blood pressure, Atherosclerosis index (LDL cholesterol/HDL cholesterol), Ischemic heart disease risk (Cholesterol/HDL cholesterol) *p<0.05.

Table 3. The correlation between MedDiet and various parameters was assessed using Spearman's correlation.

	Spearman's rho	p
Atherosclerosis index	-0.136	**0.020***
Ischemic heart disease risk	-0.185	**0.001***
CK-MB	-0.184	**0.029***
Triglycerides (mmol/l)	-0.135	**0.021***
HDL (mmol/l)	-0.192	**0.001***
SBP (mmHg)	-0.263	**<0.0005***
Fasting glucose level (mmol/l)	-0.419	**<0.0005***

Atherosclerosis index (LDL cholesterol/HDL cholesterol), Ischemic heart disease risk (Cholesterol/HDL cholesterol), HDL – (High Density Lipoprotein), SBP - systolic blood pressure, *p<0.05.

values (r = -0.135, p = 0.021) and weak positive correlation with serum HDL cholesterol values (r = -0.192, p = 0.001). The MedDiet score had a weak negative correlation with the atherosclerosis index (LDL cholesterol/HDL cholesterol) (r = -0.136, p = 0.020), with a clear trend of participants without ACS having lower values of the atherosclerosis index and higher values of the MedDiet score. Additionally, the MedDiet score had a weak negative correlation with the cardiac necrosis biomarker CK-MB (r = -0.184, p = 0.029).

The results of the MedDiet score for the study participants were divided into four groups (quartiles), based on the following criteria: Group 1: MedDiet score 0-19; Group 2: MedDiet score 20-23; Group 3: MedDiet score 24-28; Group 4: MedDiet score ≥29. We used analysis of variance (ANOVA) to determine if there were any significant differences in certain variables among the four groups of MedDiet scores.

The mean values of systolic blood pressure varied significantly among the MedDiet score quartiles (p<0.0005), with the lowest values found in the highest MedDiet score quartile. The difference in systolic blood pressure between the first and fourth quartile was about 13 mm Hg, or 10% of the overall sample's mean value of 138.9 mmHg. Similarly, the mean values of fasting blood glucose also differed significantly among the quartiles (p<0.0005), with the highest values recorded in the first quartile (8.3 mmol/l) and the lowest in the fourth (6.1 mmol/l). There were also significant differences in the mean values of HDL cholesterol

Table 4. Multivariate analysis of different predictors for acute coronary syndrome.

	Multivariate analysis	
	OR (95% CI)	**p Value**
Years	1.063 (1.025 – 1.101)	**0.001***
Male gender	4.071 (1.901 – 8.719)	**<0.0005***
Positive family history of ACS	0.670 (0.284 – 1.580)	0.36
Smoker	3.067 (1.322 – 7.114)	**0.009***
BMI	0.902 (0.839 – 0.970)	**0.005***
SBP (mmHg)	1.020 (1.003 – 1.037)	**0.018***
Fasting glucose level	1.520 (1.270 – 1.819)	**<0.0005***
Cholesterol level	0.713 (0.488 – 1.041)	0.08
HDL - Cholesterol	1.255 (0.443 – 3.553)	0.669
Atherosclerosis index	2.288 (0.920 – 5.694)	0.075
Ischemic heart disease risk	0.557 (0.240 – 1.291)	0.173
MedDiet score	0.783 (0.722 – 0.849)	**<0.0005***

OR - Odds ratio, CI - Confidence interval, ACS - acute coronary syndrome, BMI - body mass index, SBP - systolic blood pressure, Atherosclerosis index (LDL cholesterol/HDL cholesterol), Ischemic Heart Disease risk (Cholesterol/HDL cholesterol), *p<0.05.

among the quartiles (p=0.009), with the highest values found in the third and fourth quartiles (1.45mmol/l and 1.32mmol/l respectively) and the lowest in the first quartile (1.14 mmol/l). A model for the occurrence of ACS in relation to observed clinical and biochemical risk factors was developed using multivariate binary logistic regression (Table 4). The results of the regression analysis showed that age (p = 0.001), gender (p < 0.0005), smoking (p = 0.009), BMI (p = 0.005), systolic blood pressure (p = 0.018), fasting glucose level (p < 0.0005) and MedDiet score (p < 0.0005) are an independent predictors for ACS.

The odds ratio for age is 1.063 (1.270 - 1.819), which indicates that in our sample, an increase in age by one increases the risk of developing ACS by 6.3%. The odds ratio for male gender is 4.071 (1.901 - 8.719), which indicates that men in our sample had a 4 times higher risk of developing ACS than women. The odds ratio for smokers is 3.067 (1.322 - 7.114), which indikates that smokers in our sample had about three times higher risk of developing ACS than non-smokers. The risk ratio (odds ratio) for BMI is 0.902 (0.839 - 0.970), which means that the subjects in our sample had a lower risk of ACS by about 10% for each increase in BMI by 1. The odds ratio for systolic blood pressure is 1.020 (1.003 – 1.037), which means that with an increase in systolic blood pressure by 1 mmHg in our sample, the subjects had a 2% higher chance of developing ACS. The risk ratio (odds ratio) for blood glucose value is 1.520 (1.025 - 1.101), which means that with an increase in blood glucose value by 1 mmol/l in our sample, the subjects had a 52% higher chance of developing ACS. The odds ratio for the MedDiet score is 0.783 (0.722 - 0.849), which means that with an increase in the MedDiet score by 1, the subjects in our sample had a lower chance of developing ACS by 21.7%.

Discussion

Preventing CHD, particularly ACS, is now more crucial than ever as the initial occurrences of these conditions can be fatal, debilitating and require costly intense medical treatment (25). Maintaining a healthy lipid status, keeping arterial blood pressure within normal limits, good glycemic control, and a lack of a family history of CVD are associated with a low risk for CHD development. However, a small percentage of adults have this favorable health profile (26).

In our study, we examined the relationship between the MedDiet score and the occurrence of ACS. The key findings revealed that individuals with ACS had significantly lower MedDiet scores compared to those without ACS. The MedDiet score was found to be an excellent marker for ACS, with a cut-off value of 22.5, sensitivity of 0.773, and specificity of 0.778. Participants without ACS had lower systolic blood pressure, blood glucose levels, atherosclerosis index, and cardiac necrosis biomarker CK-MB, but higher HDL cholesterol values compared to those with ACS. A multivariate binary logistic regression analysis identified age, gender, smoking, BMI, systolic blood pressure, fasting glucose level, and MedDiet score as independent predictors for ACS.

Better adherence to the mediterranean diet is associated with a reduced risk of CHD (10). Numerous studies evaluated the impact of known risk factors for the occurrence of an acute cardiovascular event and found that better adherence to the MD principle is associated with a reduced risk for the occurrence of ACS (27-29). The EPIC Study results revealed that subjects with high MedDiet scores compared to subjects with low MedDiet scores had a statistically significant lower risk of developing ACS (30). A 1-point increase in the MedDiet score was associated with a 6% risk reduction for ACS among subjects of both sexes (30). In our study, we found that as the MedDiet score increased by 1, the likelihood of developing ACS decreased by 21.7% in our sample.

Panagiotakos et al. investigated the link between certain cardiovascular risk factors and adherence to the Mediterranean diet (MD) using the 55-point MedDiet score (20). After adjusting for factors such as sex, age, energy intake, tobacco use, physical activity, and education level, the study found a statistically significant correlation between total cholesterol levels and MD adherence ($p<0.001$). The PREDIMED study, which looked at 772 healthy individuals aged 55 to 80, also found that compared to a low-fat diet, the MD led to better outcomes in variables such as blood pressure, glucose levels, and cholesterol levels (31,32). Furthermore, blood glucose levels were found to be significantly lower in the group following the MD compared to the low-fat group. These findings align with those of a systematic literature review, which also found that the MD led to positive changes in metabolic syndrome risk factors (33).

There is little data from the literature on the influence of MD on the values of biochemical parameters of cardiac necrosis (CK, CK-MB, and troponin) in ACS (34). The relationship between adherence to the principles of MD and the severity of consequences and short-term prognosis of ACS was examined. The results of the study showed that the MedDiet score was negatively correlated with the initial values of troponin I, CK, and CK-MB. After adjusting for various bias factors, it was observed that as the value of the MedDiet score increased, the value of troponin and CK-MB enzyme was statistically significantly lower. Based on the results of this research, scientists conclude that eating habits that significantly correlate with MD can be a protective factor in the severity of the manifestation of ACS (34). Our research findings do not show a statistically significant association between adherence to the Mediterranean diet principles and the levels of cardiac troponin I, CK, and CK-MB. However, it is important to note that other studies have reported a positive correlation between better adherence to the Mediterranean diet and improved outcomes in ACS. These studies suggest that patients with a stronger adherence to the Mediterranean diet are more likely to experience unstable angina pectoris as their first episode of ACS rather than acute myocardial infarction, indicating potentially less severe ACS outcomes (34). It was established that healthy lifestyle, which, in addition to physical activity and avoiding smoking, also implies adherence to the MD seemed to be associated with less severe cardiac events and lower risk of death or rehospitalization 30 days after the event (35). Researchers determined a cut-off value of MedDiet score for Greek population, presented as the optimal value of the MedDiet score that distinguishes a patient with ACS from a control group, and it was 28 (20). In our “non-mediterranean” sample of the population, the determined cut-off value for MD score was 22.5, and it was shown that people with a MedDiet score higher than 22.5 have a statistically significantly lower chance of developing ACS. However, in the same Greek population study, authors divided the large range of the MedDiet score scale into several categories (represented by terciles)

0-20 first category, 21-35 second category and 36-55 third category.

This model presented a consistent negative correlation between the value of the MedDiet score and the occurrence of ACS, indicating a statistically significantly lower incidence of ACS in the last tertile (20). In our research, we presented the value of the MedDiet score in quartiles (4 categories): I category MedDiet score value 0-19, II category 20-23, III category 24-28 and IV category 29-55. Our research found that individuals in the highest category of adherence to the MD had 46% less chance of experiencing an acute coronary syndrome (ACS) compared to those in the lowest category of adherence. Analyses showed that there are negative correlation between the mean values of individual variables shown in relation to the quartiles of the MedDiet score. Differences in the mean values of systolic blood pressure, fasting glycemia, and serum HDL cholesterol levels were negative correlated to MedDiet score quartiles, indicating that better adherence to the MD negatively correlates with risk factors for the onset or recurrence of ACS.

While the study provides valuable insights, there are some limitations to consider. Firstly, the study design was observational, which means causality cannot be established, and there may be confounding factors influencing the results. Additionally, the study relied on self-reported dietary information, which is subject to recall bias and may not accurately represent participants' actual dietary intake. The sample size and participant demographics may limit the generalizability of the findings to broader populations. Furthermore, the study only included certain risk factors and did not account for other potential confounders that could impact the association between MedDiet score and ACS. Finally, as with any statistical analysis, there is always a possibility of type I or type II errors, and further research is needed to validate the findings and assess the long-term effects of the MedDiet score on ACS.

Conclusion

The current research suggests that following the Mediterranean diet can have a protective effect on the incidence and severity of acute coronary syndrome in patients who are already ill and in those at a higher risk of developing cardiovascular disease. Given the projected increase in cardiovascular disease and acute coronary syndrome cases in the future, it is crucial for healthcare professionals to make efforts to promote healthy eating habits such as the Mediterranean diet to the general population.

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