

Cost-benefit analysis of mediterranean diet and medication in chronic heart failure patients

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Abstract

Introduction: Long-term adherence to the Mediterranean dietary pattern has been recognized to contribute to cardiovascular disease (CVD) prevention. The purpose of this study was to estimate the cost-benefit of the Mediterranean diet as compared to standard medication therapy in patients with chronic heart failure, in reducing cardiovascular events. The study endpoints were the incidence of combined CVD event (death and rehospitalization) at 6 and 12 months.

Material & Methods: 263 consecutive, hospitalized patients (63 ± 13 years, 84% men) were enrolled. The total cost of the Mediterranean diet was calculated in €/month based on the diet pyramid's portion recommendations as outlined by the Ministry of Health and Welfare (1999). The level of adherence was measured with the MedDietScore dietary score. The cost of medication was calculated in €/month and included anticoagulants and antihypertensive agents, statins, beta-blockers, ACE-antagonists, diuretics and drugs for treating diabetes mellitus.

Results: The average monthly cost of full adherence to the Mediterranean diet was 178.63€, while the average monthly cost of medication was 77.10€. Increased adherence to the Mediterranean diet was associated with reduced risk of cardiovascular episode 1-year post-hospitalization (0.96, 95%CI 0.92, 1.00). For

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every 10 more Euros spent to maintain the Mediterranean diet in relation to medication, the risk for CVD events was reduced by 19% ($p = 0.09$).

Conclusions: The present analysis suggests that healthy eating is both an effective and economic model to reduce cardiovascular events in patients with chronic heart failure, under optimal medical therapy.

Key words: acute coronary syndrome, heart failure, Mediterranean diet, medication, secondary prevention

1. Introduction

Heart failure (HF) is a major public health problem due to high mortality and morbidity rates and health care costs. During the last decades the prevalence of heart failure is increasing. This may be due to the aging of the population, the improved treatment of cardiovascular diseases (CVD) that defend from early death and especially acute coronary syndromes or the combination of both. In the developed countries one in five people is expected to develop HF at some point of their lives. At a global level, 17-45% of hospitalized patients die within one year after the first admission while the majority of patients die within 5 years. Treatment of CVD events has increased the patients' survival rates. However, those patients are in higher risk of developing HF [1].

Despite the improvement in patients' survival, the disease incidence remains stable. Risk factors, such as ischemic heart disease, hypertension, smoking, obesity and diabetes can predict the incidence of HF and its severity [1]. As a result, HF has become a chronic disease with 26 million diagnosed adults worldwide; while a 4% of total hospitalizations are attributed to first diagnosis of HF. This rate is underestimated as it doesn't include the secondary diagnosis of the disease or other causes of hospitalization of patients with CVD. The risk of preventable hospitalizations and mortality strongly increases with the number of comorbid conditions. Comorbid illnesses, such as hypertension, coronary heart disease and atrial fibrillation, are usually present, especially in the elderly. These conditions increase the risk of developing HF and also contribute to the morbidity

and mortality of patients with established HF [2].

However, HF treatment remains quite costly for patients, whereas the outcome of HF remains poor and the survival rate is still lower than other chronic diseases, like cancer [2]. While the prevalence of the disease and the medication cost remain high, the non-pharmaceutical approach of the disease are considered important. The adoption of a healthy diet is an effective and less costly way to reduce the incidence of the disease and to treat clinical conditions coexisting with HF, such as obesity, diabetes, hypercholesterolemia and hypertension. A number of studies highlight the role of the Mediterranean diet as a cardioprotective factor. A Mediterranean dietary pattern offers a variety of health benefits and reduces the risk of developing CVD. It is mainly characterized by foods of non-animal origin such as pasta, rice, pulses and fresh vegetables, with high everyday use of olive oil (as the main source of fat intake) and moderate consumption of red wine. It has been shown that high adherence to the Mediterranean diet is associated with a reduced long-term risk of developing HF [3, 4] by affecting the biochemical markers of the disease, while the Mediterranean diet has shown to have beneficial impact on diastolic and systolic function of the left and right ventricle [5].

However, diet cost has not been evaluated extensively. In the present work, we aimed to assess the cost-benefit of the Mediterranean diet as compared to the standard medication (relative cost) and its association with the prevention of cardiovascular events (benefit) of patients with chronic HF in up to one-year follow-up after their hospitalization.

2. Materials and Methods

2.1. Study sample

From 2006 to 2009, 263 consecutive patients with first diagnosed acute coronary syndrome (ACS) and left ventricular systolic dysfunction (LVSD) or HF with preserved ejection fraction (HFpEF) were admitted to the First Cardiology Clinic of the University of Athens School of Medicine. This observational study included all patients who accepted to participate and were able to provide necessary information about their medical history, their medication and their dietary habits (participation rate 88%). The study excluded patients with known chronic neoplastic and systemic inflammatory diseases, patients who did not survive 48 hours post-hospitalization, patients with chronic alcohol abuse and patients with severe liver disease (cirrhosis). Systolic dysfunction of the left ventricle was defined by echocardiographic measurement of the ejection fraction, equal to or less than 40%, according to recent guidelines of the European Heart Association [6]. Of the enrolled patients, n=221 (84%) were men (63 ± 13 years) and n=41 (16%) were women (65 ± 13 years).

2.1.1 Bioethics

The current work was approved by the Medical Research Ethics Committee of the First Cardiology Clinic, University of Athens and was performed according to the principles of the Declaration of Helsinki (1975).

2.2. Clinical characteristics

A 12-lead electrocardiogram was performed in hospital entry to separate patients according to whether or not they exhibited ST segment elevation or other electrocardiographic abnormalities. An echocardiography was performed to assess LVSD in which the left ventricular ejection fraction was defined as being less than 40% [7].

2.3. Medical history

In all patients, a detailed medical history was recorded including previous hospitalizations due to coronary heart disease, previous heart surgery, history and management of hypertension, hypercholester-

olemia and diabetes mellitus, family history of CVD and symptoms of HF. During hospitalization several biomarkers were measured including troponin I and the MB fraction of creatine phosphokinase to evaluate myocardial cell necrosis and creatinine, urea and uric acid to assess renal function.

2.4. Medication

A detailed recording of patients' medication was carried out including the doses received by each formulation. Patients were asked whether the financial crisis has affected their ability to buy these pharmaceutical products and if they have replaced formulations with lower cost products. They were also asked to identify their degree of satisfaction from the public health system (ranging from 1 to 10) and how often they visit their cardiologist.

2.5. Anthropometric and socio-demographic characteristics

With regard to the anthropometric characteristics, height and weight were measured to the nearest 0.5cm and 100g, respectively. Body mass index (BMI) was then calculated as weight (in kilograms) divided by height (in meters) squared. Socio-demographic characteristics included: age, sex, family status, years of education, type of employment, physical activity, and current or former smoking habits. Current smokers were defined as those who smoked >1 cigarette/day or who had stopped tobacco during the past 12 months. Former smokers were defined as those who had stopped smoking >1 year previously. The rest of the sample's subjects were classified as non-smokers.

2.6. Dietary habits evaluation

The level of adherence to the Mediterranean diet was assessed with the MedDietScore [8]. This score is based on the weekly consumption of eleven food groups. An individual score for each component is calculated, ranging from 0–5. For the consumption of items that are presumed to closely characterize the Mediterranean pattern (e.g., non-refined cereals, fruits, vegetables, legumes, potatoes, fish, olive oil), individuals who reported no consumption were as-

Table 1: Selected studied food groups and average monthly cost of each group

Mediterranean Diet food group	Selected food	Median market Price (€/month)
Red meat	Beef, pork	2,20
Sweets	Raisins, pasteli (sesame bar), halva, honey	1,60
Eggs	Chicken eggs	5,70
Potatoes	Fresh potatoes	1,20
Pulses	Beans, lentils, chickpeas	4,18
Olives	Black and green olives	4,75
Poultry	Whole fresh chicken	7,20
Fish	Red mullet, sardines, sea bream, sea bass, squid, octopus	16,80
Dairy products	Fresh milk & yogurt (low fat)	34,80
Fruits	Orange, apple, banana, pear, mandarin orange	14,40
Olive oil	Virgin and extra virgin olive oil	13,20
Vegetables	Cucumber, tomatoes, onions, lettuce, beets, spinach, cabbage, broccoli, pumpkin, eggplants, peppers, carrots, mushrooms	34,20
Non-refines cereals and products	Whole-grain breakfast cereals, whole-grain toasted bread, brown rice, whole grain pasta.	27,00
Red wine	Greek red wine	11,40
Total Cost per patient		178,63€

signed a score of 0, and scores of 1–5 were assigned for rare to daily consumption. For the consumption of foods that are presumed to diverge from this pattern (e.g., meat and meat products, poultry, full-fat dairy products), participants were assigned scores on a reverse scale (from 5 when they reported no consumption to 0 when reported almost daily consumption). Regarding alcohol intake, a score of 5 was assigned for consumption of less than 300 mL of alcohol/d, a score of 0 was assigned for no consumption or consumption of 700 ml/d and scores of 4–1 were assigned for consumption of 600–700, 500–600, 400–500 and 300–400 mL/d (100mL have 12g of

ethanol concentration), respectively. The MedDiet-Score has a range of 0–55. Higher values of the MedDietScore indicated greater adherence to the Mediterranean diet.

2.7. Endpoints

The study primary endpoint was the incidence of a combined CVD event at 6 and 12 months; secondary endpoint included death due to CVD within 1 year following hospitalization. The classification of the CVD outcomes was based on the ICD-10 criteria for ACS, angina pectoris, or other ischemic types (410–414.9, 427.2, 427.6). Regarding the patients who

Table 2: Selected pharmaceutical substances and average monthly cost for each substance

Pharmaceutical substance	Median Price (€/month)
Acetylsalicylic acid	1.76
Clopidogrel	15.65
Statin	34.76
Metoprolol	4.69
Carvedilol	1.52
Ramipril	7.72
Furosemide	1.20
Acenocoumarol	1.34
Metformin	3.59
Insulin	4.86
Total Cost per patient	77.10€

Table 3: Lifestyle and clinical characteristics of the n = 263 HF patients that participated in this cost-benefit study

	Men (n=221)	Women (n=42)
Age (years)	63.0 ± 13.41	65.31 ± 12.67
BMI (kg/m ²)	28.07 ± 5.07	27.66 ± 3.87
MedDietScore (0-55)	26.26 ± 6.85	27.22 ± 6.02
Physical activity (yes)	101 (57.7%)	17 (54.8%)
Current Smoking (yes)	61 (27.7%)	4 (10.2%)
History of Hypertension (yes)	65 (32.3%)	20 (7.6%)
History of Diabetes type II (yes)	57 (26.6%)	13 (4.9%)
History of Hypercholesterolemia (yes)	37 (17.1%)	8 (3.0%)
History of Hypertriglyceridemia (yes)	102 (45.6%)	18 (6.8%)

died, their death was recorded as an event, followed by the date and etiology, as it emerged from the medical records.

2.8. Calculation of Mediterranean diet's cost

The prices used to calculate the total cost of food were obtained from three large foodmarkets in Athens metropolitan area. Since the prices vary between different types of fruit, red meat, pulses and seafood, the most typical types of each food group were selected. The types of foods selected as well as the average monthly cost of each food group are shown in **Table 1**. Seasonal variation was not taken into account as the diet cost was calculated in February 2017. In order to calculate the total cost of the Mediterranean diet, the average cost per serving was calculated for each food group and then multiplied by the monthly consumption frequency of servings for each food group. The serving sizes used were based on the dietary guidelines for adults in Greece [9]. The total cost of the diet was equal to the sum of all food groups in €/month (**Table 1**). Then, and for each patient an individual – specific cost was calculated based on: the level of adherence (value of Med-

DietScore) multiplied by the total cost (of ideal adherence to the dietary pattern). This net value (i.e., individuals' expenses for food / expenses for medication) was used in the equation that was developed for the estimation of the cost versus the benefit.

2.9. Calculation of medication's cost

All of the enrolled patients received aspirin, clopidogrel and statins; 197 patients (75%) received metoprolol as beta-blockers, while 66 patients (25%) received carvedilol. 86 patients (33%) received ACE-inhibitors and diuretic treatment (furosemide) and 200 patients (76%) received acenocoumarol as anticoagulant treatment; 150 patients (57%) received metformin and 50 patients (19%) were under insulin treatment. In order to calculate the total medication cost, the average monthly cost per patient was calculated for each pharmaceutical substance by multiplying the percentage of patients receiving the substance with the corresponding value and daily dosage. It was then divided by the number of doses and mul-

Table 4: Distribution of CVD events in HF patients according to their level of adherence to the Mediterranean dietary pattern

<i>Mediterranean diet adherence</i>	6-mo any CVD event	12-mo any CVD event	Death due to CVD within 12-mo
Low, MedDietScore<25	15%	29%	10%
Moderate, MedDietScore<35	19%	29%	4.7%
High, MedDietScore>35	9%	22%	2.6%
<i>p-value</i>	0.22	0.35	0.09

multiplied by 30. The total medication cost was equal to the sum of all pharmaceutical substances in €/month (Table 2).

2.10. Statistical analysis

Continuous variables are presented as mean values \pm standard deviation, while categorical variables are presented as absolute values and relative frequencies. Associations between the categorical variables were performed using the Pearson χ^2 correlation test, while the t-test was used to assess group differences between mean values of continuous variables following a normal distribution. The current work evaluated the association between the diet cost in relation to the medication cost concerning the endpoints. For that reason, we created a latent variable, DietDrugCost, as the ratio of diet - to - medication cost, aiming to examine how the variability of diet cost affects the endpoints. Multi-adjusted logistic regression models were estimated to test the association between DietDrugCost and the likelihood of developing a CVD event or a fatal CVD event with 6 and 12 months following hospitalization. Results are presented as odds ratio and 95% confidence interval (CI). All reported p values are based on two-sided tests. The SPSS statistical software package version 23.0 (Statistical Package for Social Sciences, SPSS Inc., Chicago, Illinois, USA) was used for all statistical calculations.

3. Results

The distribution of patients' characteristics is shown

in Table 3. During the 6 months following previous hospitalization, 14.5% of patients (79% men, 21% women) had a recurrent CVD event, while and during the 12 months the CVD event rate was 27.0%. The fatal CVD events' incidence within 1 year (12 mo) following hospitalization was 6.1% (79% men, 21% women). The distribution of patients according to the studied outcomes, by the level of adherence to the Mediterranean diet, is presented in Table 4. As it can be seen, a borderline association ($p < 0.10$) between adherence to Mediterranean diet and death due to CVD 1-year following hospitalization was observed; as regards CVD events during 6- and 12-months following ACS or HF diagnosis, no significant associations were observed with level of adherence to the Mediterranean diet (Table 4). No gender-specific analysis was performed due to the small number of women studied.

3.1 Costs of adherence to the Mediterranean diet and cost of medical treatment

The average monthly cost of medication for each patient was 77.10€ and the average monthly cost of diet was 178.63€ /patient.

3.2 Cost-benefit analysis of adherence to the Mediterranean diet vs cost of medical treatment on 6-mo and 12-mo CVD incidence.

Three logistic regression models were estimated in order to test the research hypothesis. In model 1 (Table 5), in which only age and gender were taken

Table 5: Results from logistic regression models that evaluated the association between the diet and medication cost (DietDrugCost) on the development of CVD events among n = 263 heart failure patients

	6-mo CVD event		12-mo CVD event		Death due to CVD within 12-mo		
	Odds ratio (95% CI)	P	Odds ratio (95% CI)	P	Odds ratio (95% CI)	P	
Model 1 DietDrugCost (per 1 unit)	0.98 (0.96-1.01)	0.30	0.98 (0.96-1.00)	0.01	0.96 (0.93-1.00)	0.06	Age, sex
Model 2 DietDrugCost (per 1 unit)	0.99 (0.97-1.02)	0.83	0.99 (0.97-1.01)	0.39	0.98 (0.95-1.02)	0.44	Model 1 + htn, dmel, hchol, BMI
Model 3 DietDrugCost (per 1 unit)	0.99 (0.96-1.03)	0.69	0.99 (0.96-1.02)	0.36	0.99 (0.95-1.04)	0.89	Model 2 + smoking, physical activity

into account, it was observed that for each one euro increase in Mediterranean diet cost (also indicating higher adherence to the diet) over the medication cost, it was associated with 2% lower risk of a CVD event within 6 months (OR=0.98, 95% CI 0.96-1.01), and with 2% lower CVD event risk within 12 months (OR=0.98, 95% CI 0.96-1.00); the later could be also interpreted as follows: for every 10 euro spent to maintain adherence to the Mediterranean diet in relation to the medication, the risk for CVD events within 6 or 12 months post-hospitalization reduced by 19% ($1-(0.98)^{10}=0.19$, $p=0.09$). In model 2 we also took into account as potential confounders patients' medical history (hypertension, diabetes mellitus, hypercholesterolemia) and BMI, and in model 3 other lifestyle habits (current smoking, physical activity). In all multi-adjusted models, an increase in the diet cost over the medication cost was inversely associated with the occurrence of CVD events in 6 and 12 months, as well as the risk of death (Table 5).

4. Discussion

In the present work, we evaluated the cost-benefit of the Mediterranean diet versus the standard medication on the development of CVD events within a year following hospitalization, in patients with ACS and HF with preserved EF. A favorable effect of ad-

herence to the Mediterranean diet as compared to the standard medication was revealed in the present work, by comparing the diet cost to the cost of medication. In all models evaluated here, the increase in the patients' nutrition expenses, i.e., to better achieve adherence to the Mediterranean diet as compared to the standard medication cost, was associated with a risk reduction of CVD episodes at 6 and 12 months post-hospitalization, as well as CVD mortality. Despite the small sample size, the observational nature of the present study, and the other limitations mentioned below, the results presented here deserves further attention, since the promotion of a healthy dietary pattern seems to be an effective and economic approach for the secondary prevention of CVD patients.

The cardioprotective role of Mediterranean diet has long been confirmed by a number of studies, especially in primary prevention. High adherence to the Mediterranean diet reduces significantly the risk of developing a CVD event, even by 30-40% [10-12]. According to the PREDIMED study, higher adherence to Mediterranean diet was associated with 30% lower risk of major CVD events in high risk patients [13, 14]. Results from the EPIC study also demonstrated that adherence to the Mediterranean diet reduces the risk of coronary heart disease up to 40%

in healthy individuals and highlight the importance of this dietary pattern in primary prevention of incident coronary event [15]. The ATTICA study also evaluated the relation of the Mediterranean diet and CVD risk in an apparently healthy Greek sample of men and women; it was revealed that for each 10% increase in the MedDietScore it was associated with 15% lower likelihood of CVD risk [16]. Moreover, dietary habits have a major impact on CVD risk factors, such as blood pressure and the patients' lipidemic profile. High adherence to the Mediterranean diet is independently associated with reduced inflammation and thrombosis markers that increase CVD risk [10, 12]. As a result of the accumulative strong evidences during the past years, Mediterranean diet has been considered as an effective, non-pharmacological tool in the prevention and treatment of CVD, that also contributes to the reduction of long-term hospitalization costs and increases the likelihood of long living.

The role of the Mediterranean diet in the secondary prevention of CVD, however, lacks adequate documentation [17]. Data focusing on the effect of Mediterranean diet in patients with already developed ACS or/and HF are limited [4, 18]. Based on the few randomized clinical trials and observational studies there is supporting evidence that cardiac patients, who have adopted a Mediterranean dietary pattern, seemed to have lower probability of experiencing a second CVD event. However, the additional - to the primary prevention - mechanisms that Mediterranean diet may prevent a recurrent CVD event are not well understood and appreciated. Left ventricular function has been shown to have a high prognostic value for patients with ACS [19]. A recent study conducted by Chrysohoou et al., revealed that the Mediterranean diet contributes to preservation of left ventricular systolic function [20]. Greater adherence to the Mediterranean diet showed a beneficial association with the severity of ACS by preserving left ventricular ejection fraction. It was also observed that patients with lower adherence to the traditional dietary pattern had developed LVSD compared with the rest of the patients. MedDietScore was positively associated with ejection fraction at hospital admission and

a 1-unit increase in the MedDietScore (1/55) was associated with 6% lower risk of having LVSD at hospital admission. In addition, patients with higher adherence to the Mediterranean diet had lower risk of developing LVSD at hospitalization, and lower risk of in-hospital mortality and recurrent CVD event one month, as well as 1- and 2 years after hospitalization.

Regarding the socio-economic dimension of the findings, the average monthly cost of the Mediterranean diet was estimated to be 178.63€. The lowest monthly income in Greece is 684€, according to the official European statistics [21]. Therefore, the cost of the Mediterranean diet is 26.1% of the Greek minimum wage, which may explain the small number of patients with high adherence to this diet. It was also observed that the mean level of adherence to the Mediterranean diet was moderate, i.e., 26/55 for men and 27/55 for women (or 49% of the ideal Mediterranean dietary pattern). It has been reported by several investigators in the field of nutrition epidemiology that people of the Mediterranean are away from their traditional diet of the past. Dietary habits are strongly influenced by socioeconomic factors, in particular by income, which appears to play an important role in determining food choices. Socioeconomic status (SES) has been included among the factors related to disparities in dietary habits between different SES groups, a fact that may partially explain that lower SES groups have higher CVD risk [22, 23]. Italian and Spanish investigators indicated that the Mediterranean diet was more expensive to follow than the western dietary patterns [24, 25]. This may represent a strong economic obstacle for people to adopt a healthy diet. As a results, and taking into account that food cost is responsible for the socioeconomic disparities in diet quality, people coming from lower SES groups tend to consume more energy-dense and nutrient-poor diets.

Medication cost remains high, regardless the progress in HF therapy. HF patients' survival will be longer due to life-prolonging therapies and population aging, leading to more patients at risk for developing HF. Despite the progress in standard medication, HF patients usually require a multi-drug therapeutic scheme due to comorbid


illnesses and need frequent and long hospitalizations. At the same time one in four hospitalized patients dies within 1-year post-hospitalization and 4 in 10 are rehospitalized in less than a year, costing about 2% of total health care expenditure [26]. Consequently HF is a major problem for both the social security system and the national economy. The prevalence of HF and the mortality rates are high, and increase year-by-year. For that reason, both the pharmaceutical and the non-pharmaceutical approach are very important in order to reduce disease burden. A healthy diet seems to be an effective and less costly way to reduce HF incidence and treat the coexisting clinical conditions, such as obesity, diabetes, hypercholesterolemia and hypertension. Maintaining healthy dietary habits, as indicated by the Mediterranean model, is a prerequisite for the long-term contribution of nutrition to both primary and secondary prevention of CVD events. The combination of standard medication and healthy diet may significantly improve patients' quality of life, and reduction of hospital costs for hospitalization of patients.

5. Study limitations

There are some limitations that need to be acknowledged in the current research. The sample size was relatively small and did not allow for generalizations to the entire patients' population. At the time the study was conducted, there were no generic drugs on the market that were less expensive. Seasonal variation was not taken into account and the food

prices derived from only three large foodmarkets in Athens region, Greece. Product prices of street markets, which are usually lower than those in foodmarkets, were not included and therefore the monthly diet cost could be overestimated. The cost of a "conventional" diet was not calculated in order to estimate the extra cost of the Mediterranean pattern, because no available data exists as regards the average dietary habits of the population. The adherence to the Mediterranean diet was assessed once, with the MedDietScore, and as an average of consumption of the previous year and therefore we couldn't retrieve information concerning food groups, meals and the seasonality of foods.

6. Conclusion

The higher adherence to the traditional Mediterranean diet as compared with the standard medication improves short-term CVD risk of HF patients', suggesting a potential for long-term reduction of hospital costs. Adherence to the Mediterranean diet should be set as a primary goal in prevention strategies and CVD guidelines since it could be an effective, non-pharmacological mean for the management of CVD at population level. 

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Εισαγωγή: Είναι γνωστό ότι η προσκόλληση στο Μεσογειακό πρότυπο διατροφής συμβάλλει στην πρόληψη του καρδιαγγειακού κινδύνου. Σκοπός της παρούσας εργασίας είναι ο υπολογισμός του κόστους-οφέλους της Μεσογειακής διατροφής σε σύγκριση με τη συνήθη φαρμακευτική αγωγή, στην πρόληψη καρδιαγγειακών επεισοδίων, σε ασθενείς με χρόνια καρδιακή ανεπάρκεια στην ετήσια παρακολούθησή τους. **Υλικά & Μέθοδος:** Συλλέχθηκαν στοιχεία από 263 διαδοχικούς ασθενείς (63±13 ετών, παράγοντες, στατίνες, β-αποκλειστές, 84% άνδρες). Το συνολικό κόστος από την υιοθέτηση της Μεσογειακής διατροφής υπολογίστηκε σε €/μήνα, με βάση τις συστάσεις για μερίδες της πυραμίδας που υποδεικνύει το Υπουργείο Υγείας και Πρόνοιας (1999). Ο βαθμός προσκόλλησης μετρήθηκε με το MedDietScore διατροφικό σκορ. Το κόστος της φαρμακευτικής αγωγής υπολογίστηκε σε €/μήνα και περιλαμβάνει αντιπηκτικούς και αντιυπερτασικούς ανταγωνιστές-ΜΕΑ, διουρητική αγωγή και σκευάσματα θεραπείας του διαβήτη ως συνοδό νόσημα.

Αποτελέσματα: Το μέσο μηνιαίο κόστος της πλήρους προσκόλλησης στη Μεσογειακή διατροφή υπολογίστηκε 178,63€, ενώ το μέσο μηνιαίο κόστος της φαρμακευτικής αγωγής ήταν 77,10€. Η αυξημένη προσκόλληση στη Μεσογειακή διατροφή συσχετίστηκε με μειωμένο κίνδυνο καρδιαγγειακού επεισοδίου 1 έτος μετά τη νοσηλεία (0,96, 95%ΔΕ 0,92, 1,00). Για κάθε 10 ευρώ παραπάνω που δαπανήθηκαν για την τήρηση της Μεσογειακής διατροφής σε σχέση με την φαρμακευτική αγωγή ο κίνδυνος για καρδιαγγειακά επεισόδια μειωνόταν κατά 19% (p=0,09).

Συμπεράσματα: Χωρίς να παραγνωρίζεται η ανάγκη για τήρηση της φαρμακευτικής αγωγής, η παρούσα ανάλυση ανέδειξε ότι η υγιεινή διατροφή αποτελεί ένα ιδιαίτερα αποτελεσματικό αλλά και οικονομικό μοντέλο για την μείωση των καρδιαγγειακών συμβαμάτων, σε ασθενείς με χρόνια καρδιακή ανεπάρκεια.

Λέξεις ευρητηρίου: οξύ στεφανιαίο σύνδρομο, καρδιακή ανεπάρκεια, Μεσογειακή διατροφή, φαρμακευτική αγωγή, δευτερογενής πρόληψη

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