MEDITERRANEAN ALPHA-LINOLENIC ACID-RICH DIET (RAPESEED OIL) IN SECONDARY PREVENTION OF CORONARY HEART DISEASE.

S. RENAUD, M.de LORGERIL, N. MAMELLE.

INSERM, Units 63 and 265, 22 avenue Doyen Lepine, CP 18, 69675 Bron Cedex, France.

J. DELAYE

Cardiovascular Hospital, Bron, France.

ABSTRACT

The prudent diet prescribed to coronary patients and healthy subjects, contains a high level of linoleic acid to decrease serum cholesterol as much as possible. The Mediterranean diet associated with a low mortality rate from coronary heart disease is rather characterized by a high intake of oleic acid, and in Crete of linolenic acid. In 600 patients randomized into two groups, we compared to the usual prudent diet an adaptation of the Cretan diet with rapeseed oil based margarine, replacing most of olive oil. The Mediterranean-diet reduced cardiac death and death from all causes, as well as non fatal myocardial infarction by more than 70%. This protection was already observed two months after diet modification.

INTRODUCTION

In the Seven Countries Study (Keys A. et al, 1984), Mediterranean countries, especially Crete, have been associated with a several-fold lower mortality rate from coronary heart disease (CHD) than in Northern Europe or the US. By contrast, in secondary prevention trials by diet modification, the most successful reductions have been between 15 and 30%. In the present trial with a diet to reduce mortality and morbidity after myocardial infarction, we adapted a diet from Crete that includes a high intake of alpha-linolenic acid as supplied by rapeseed oil based margarine and of antioxidants, through a higher level of vegetables and fruit as shown in detail elsewhere (de Lorgeril, Renaud et al, 1994).

EXPERIMENTAL

600 patients, less than 70 years old, who survived a first myocardial infarction, were randomised into an experimental and a control group. The controls were advised to stick to the prudent diet high in polyunsaturated fats usually prescribed to coronary patients. Patients of the experimental group were instructed to eat more bread, vegetables, legumes, fish and less meat, no day without fruit, butter and cream to be replaced by a rapeseed oil based experimental margarine containing only 6% trans. The

oils for salads and food preparation were rapeseed and olive oil exclusively. Moderate intake of wine was allowed at meals.

The diet of the experimental group after 1 to 4 years of follow up was significantly ($p<0.001$) lower in the levels of saturated fatty acids (8.3 vs 11.8% energy), of 18:2 (3.6 vs 5.4%), but higher in 18:1 (12.9 vs 10.4%) and 18:3(n-3) (0.83 vs 0.28%), confirmed by fatty acid composition of plasma lipids. At 2, 12 and 24 months, cholesterol, triglycerides, lipoproteins, apoproteins and blood pressure were similar in the two groups. The plasma level of antioxidant vitamins E and C were significantly higher in the experimental group. Due to aspirin given to the majority of patients, no difference could be observed in platelet aggregation between the groups.

After a mean follow up of 27 months (1 to 4 years), there were 20 deaths from all causes (8 sudden deaths) in the control and 8 (0 sudden death) in the experimental group, a reduction of 70% ($p<0.02$) in the Cox proportional-hazards model. The risk ratio of cardiac death was 0.19 (95% CI 0.06-0.65, $p<0.002$) a reduction of 81%. When non fatal myocardial infarction were added to cardiac deaths, there were 33 events in the control and 8 in the experimental group, a risk ratio of 0.24 (0.11-0.55, $p<0.001$) (76% reduction).

CONCLUSIONS

This study constitutes the first demonstration that a diet adapted from a Mediterranean (Cretan) diet is much more efficient to prevent recurrences and death than the prudent diet usually prescribed. In Crete, it is only olive oil that is used as edible fat. Owing to the large intake of that oil (33% energy), vegetables and purslane, the intake of 18:3(n-3) is high (Sandker et al, 1993) that of 18:2(n-6) low. To achieve the same result in our patients, we had to replace, at least partly, olive oil by rapeseed oil and margarine that supplied a low level of saturated fatty acids but a high level of oleic and alpha-linolenic acids.Without significant changes in the level of serum lipids, mortality rate and recurrences were drastically reduced with this experimental diet, a protection starting early after diet modification (within in 2 months).

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