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Parental death from cardiovascular disease and dietary habits in an elderly group

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The present study examines the influence of parental history of death from cardiovascular disease on dietary habits and nutritional status of a group of seventy-two Spanish elderly. Those with at least one parent who had died of cardiovascular disease (43·1% of the cases) had higher diastolic blood pressure ($P < 0{\cdot}05$) and nutrient intakes less favourable from the cardiovascular risk point of view than those whose parents died of other causes. Descendants whose parents died of cardiovascular disease had higher total fat, animal fat, saturated fatty acids, myristic acid and palmitic acid intakes and a lower monounsaturated fatty acids:saturated fatty acids value than descendants of those who died from other causes (all $P < 0{\cdot}05$).

Blood pressure: Cardiovascular disease: Dietary habits: Serum lipids: Elderly

Cardiovascular disease, the principal cause of death and invalidity in developed countries (Nikkila & Heikkinen, 1990), is a clear example of a diet-related pathology. The nutritional habits which increase the risk of these diseases are well known; high intakes of animal and total fat, dietary cholesterol, animal protein as well as total energy are positively correlated with cardiovascular mortality in cross-cultural comparisons, while polyunsaturated fatty acids (PUFA), fibre and vegetable protein are negatively correlated (Connor & Connor, 1986; Nissinen & Stanley, 1989; Rudman, 1989; Simopoulos, 1989; Katsouyanni *et al.* 1991).

A number of studies have investigated relationships between blood lipid and lipoprotein levels and family history of cardiovascular disease (Shear *et al.* 1985; Freedman *et al.* 1986). Fewer studies have examined the dietary intake of subjects whose parents had died of cardiovascular disease. It is possible that there may be genetic or cultural determinants of dietary habits, which may in turn determine plasma cholesterol concentrations and other cardiovascular risk factors (Cavalli-Sforza, 1990; Oliveria *et al.* 1992).

Therefore, the purpose of the present study was to assess the dietary and nutritional differences between two elderly groups, classified by parental cause of death (cardiovascular and other causes).

MATERIALS AND METHODS

The dietary habits and nutritional status of seventy-two non-institutionalized elderly (thirty-four males and thirty-eight females), aged 65–89 years (mean age 71 (SE 1·4) years), who attended the physician's general medicine surgery at the INSALUD (Spanish Social Security) in Madrid during October and November 1990 were studied. Subjects who voluntarily agreed to take part in the study and who were able to present the death certificate(s) of their parent(s) were included in the study; selected subjects comprised 70% of all the subjects aged 65–89 years who attended the physician's surgery during the 2-month period.

The study was approved by the Human Research Review Committee of the University Complutense of Madrid, Faculty of Pharmacy.

The elderly were grouped according to the cause of death of their parents: one group included those who had at least one parent who died of cardiovascular disease (C; coronary ischaemic cardiopathy or cerebrovascular ischaemic accident), and the other group included those whose parents died of other causes (NC).

For the present study dietary, anthropometric, biochemical and blood pressure data were recorded.

Diet survey

A prospective food record questionnaire was compiled during five consecutive days (including Sunday). A set of kitchen scales was provided for all the elderly to facilitate the food weighing. After the questionnaire was completed, the booklets were returned in person. A qualified nutritionist inspected the records to ensure that they were complete and that sufficient detail had been recorded. In the same interview a food frequency intake questionnaire was completed.

The energy and nutrient content of all the food ingested was determined using the *Spanish Food Composition Tables* (Institute of Nutrition, 1990*a*). Intakes were compared with dietary recommendations for the Spanish population made by the Institute of Nutrition (1990*b*).

Anthropometric survey

Weight and height were determined without shoes, using a digital electronic weighing scale (Seca alpha; Rue Lavoisier 91430, Igmy, France; range: 0·1–150 kg) and a digital stadiometer (Harpender Pfifter 450; Badem, Padum Aveny, Carlstadt, NJ, USA; range 0·70–2·05 m) respectively. Waist and hip diameter were also determined using a measuring tape (range 0–150 cms). From these data, body mass index (Quételet index; weight/height^2; kg/m^2) and waist:hip ratio were calculated.

Biochemical survey

Fifty-seven elderly (twenty-seven males and thirty females) agreed to the blood sampling. Blood was drawn without stasis by venepuncture (antecubital fossa) after an overnight 12 h fast. Serum was obtained by centrifugation at 1100 ***g*** for 10 min at 4°. Triacylglycerols were measured by enzymic hydrolysis (GPO/PAP method; Merck, Merck-Igoda, S. A. Apdo., 47 de Mollet del Vallés, Barcelona, Spain; coefficient of variation (CV) 3·1%; Bucolo & David, 1973). Total cholesterol (TC; Merck; CV 2·2%) and high-density-lipoprotein (HDL)-cholesterol (Merck; CV 2·4%) were determined by cholesterol esterase (*EC* 3.1.1.13)–cholesterol oxidase (*EC* 1.1.3.6) colorimetry (Allain *et al.* 1984), the latter after precipitation of serum with phosphotungstic acid and Mg^{2+} (Burstein *et al.* 1970), automated in an autoanalyser (ERIS-6170; Merck-Olympus-Eppendorf). Low-density-lipoprotein (LDL)-cholesterol concentrations were calculated according to Friedewald *et al.* (1972) and very-low-density-lipoprotein (VLDL)-cholesterol was calculated according to Wilson *et al.* (1981).

Blood pressure

Blood pressure was measured three times after a 5 min rest in the right arm of the seated participant by a trained technician using a Hawksley random-zero sphygmomanometer (W.A. Baum Co., Copaigue, NY, USA) and an appropriate-size cuff. First- and fifth-phase Korotkoff sounds were recorded (Expert Committee of the Spanish Ministry of Health, 1991) and the mean of the second and third blood pressure values was used in analysis.

Statistical methods

Means with their standard errors are presented for all the elderly by sex and parental cause of death.

Data were compared by parametric (Student's t test and analysis of variance) and non-parametric (Mann–Whitney and Kruskal–Wallis) tests to determine whether differences in variables existed with respect to parental cause of death. Differences were considered statistically significant at $P < 0{\cdot}05$ (Wonnacott & Wonnacott, 1977).

RESULTS

Cardiovascular disease was the cause of death of one or both parents for 43·1 % and 12·5 % respectively of the elderly studied. Non-cardiovascular causes of death were: cancer (33 %), cirrhosis of liver (5 %), renal insufficiency (9 %), grave respiratory insufficiency (4 %), diabetes (5 %), infection (22 %), puerperium (5 %), accidents and suicide (15 %). The remaining 1 % of the parents were still alive.

When at least one of the parents died of cardiovascular disease (group C), we observed a higher systolic and diastolic blood pressure in their descendants than that in the NC group, the difference being significant for diastolic blood pressure ($P < 0{\cdot}05$; Table 1). If hypertension is defined as diastolic blood pressure $\geqslant$ 90 mmHg or systolic blood pressure $\geqslant$ 160 mmHg, 30·8 % of group C elderly were hypertensive compared with 6·3 % of group NC elderly.

There were no anthropometric differences between C and NC groups (Table 1). Group C elderly tended to have higher total serum cholesterol and LDL-cholesterol values than group NC elderly, although the difference was not significant (Table 1). The cholesterol concentrations of 86·4 % of the group C elderly and 75·8 % of the group NC elderly were higher than 5·2 mmol/l and 45·5 and 30·3 % respectively had serum cholesterol concentrations greater than 6·2 mmol/l.

Group C elderly tended to have higher intakes of most foodstuffs, except cereals, vegetables, legumes and fish, but the differences were not statistically significant (Table 2).

Table 3 shows the nutrient intakes and Fig. 1 shows the energy and nutrient intakes as a percentage of the recommended intakes (Institute of Nutrition, 1990*b*). Intakes of energy, Zn, Mg and vitamin D were lower than recommended values, and intakes of protein, niacin, vitamins B_{12} and C were greater than recommended values.

Intakes of fibre, Ca, Fe, Mg, thiamin and folate were lower than recommended intakes (Institute of Nutrition, 1990*b*) for 58·6, 34·5, 34·5, 79·3, 13·8 and 51·7 % respectively, of C elderly, whereas for NC elderly, intakes of these nutrients were lower than recommended for 42·9, 28·6, 25·7, 34·3, 11·4 and 42·9 % respectively, of this group.

Comparison of energy and nutrient intakes of groups C and NC (Table 3), revealed that the greatest differences were for fat intakes which were higher among group C elderly; differences were significant for total fat (g/d; $P < 0{\cdot}05$), saturated fatty acids (SFA; g/d and % energy; $P < 0{\cdot}01$ and $P < 0{\cdot}05$ respectively) and animal fat (g/d; $P < 0{\cdot}05$). Group

Table 1. *Physical and biochemical characteristics of Spanish elderly grouped according to parental cause of death*

(Mean values with their standard errors)

Study group…	Subjects whose parents died of cardiovascular disease						Subjects whose parents died of other causes					
	Total (*n* 31)		Males (*n* 13)		Females (*n* 18)		Total (*n* 41)		Males (*n* 21)		Females (*n* 20)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Age (years)	71·4	1·1	71·3	2·0	71·4	1·4	70·7	1·0	71·2	1·3	70·1	1·5
Wt (kg)	64·1	2·1	68·0	3·6	61·8	2·5	67·5	2·0	69·5	2·6	65·8	3·0
Ht (m)	1·55	0·10	1·64	0·07	1·49	0·06	1·57	0·08	1·62	0·09	1·52	0·04
BMI (kg/m^2)	26·9	0·9	25·6	1·7	27·7	1·1	27·7	0·9	26·6	1·1	28·6	1·4
Waist:hip	0·99	0·1	1·02	0·1	0·93	0·1	0·95	0·1	0·98	0·1	0·92	0·1
Systolic blood pressure (mmHg)	145·8	6·6	136·0	13·3	151·9	6·6	139·1	4·1	135·0	7·1	143·1	4·4
Diastolic blood pressure (mmHg)	92·3	4·8	98·0	11·1	88·8	4·0	80·0*	2·5	79·9	3·3	80·1	4·1
Triacylglycerols (mmol/l)	1·13	0·1	1·03	0·2	1·18	0·1	1·24	0·1	1·29	0·1	1·19	0·1
Cholesterol (mmol/l)	6·11	0·2	6·07	0·4	6·13	0·3	5·82	0·2	5·63	0·2	5·99	0·3
HDL-cholesterol (mmol/l)	1·51	0·1	1·58	0·2	1·49	0·1	1·29	0·1	1·25	0·1	1·34	0·1
LDL-cholesterol (mmol/l)	4·13	0·2	4·04	0·5	4·16	0·3	4·03	0·2	3·80	0·2	4·16	0·3
VLDL-cholesterol (mmol/l)	0·52	0·1	0·47	0·1	0·54	0·1	0·57	0·1	0·59	0·1	0·55	0·1

BMI, body mass index (weight/height^2); HDL, high-density-lipoprotein; LDL, low-density-lipoprotein; VLDL, very-low-density-lipoprotein. Mean value was significantly from the total value for the group whose parents died of cardiovascular disease: *$P < 0·05$.

Table 2. *Food intakes (g/d) of Spanish elderly grouped according to parental cause of death**

(Mean values with their standard errors)

Study group...	Subjects whose parents died of cardiovascular disease						Subjects whose parents died of other causes					
	Total		Males		Females		Total		Males		Females	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Total foods	1509·7	73·9	1658·9	133·8	1404·3	76·9	1411·8	63·6	1391·2	87·1	1431·3	94·5
Cereals	157·8	13·4	198·5	25·1	129·1	10·3	160·6	11·9	175·3	14·2	146·6	18·6
Milk	350·4	42·1	331·4	72·8	363·8	51·8	317·3	34·0	255·7	43·7	375·5	49·0
Eggs	17·5	2·8	22·0	3·7	14·3	3·9	12·9	1·9	14·9	3·5	10·9	1·7
Oil	27·0	3·1	30·0	5·7	24·8	3·4	21·7	1·7	21·7	1·9	21·6	2·9
Sugar	20·8	4·2	33·3	8·3	12·0	2·9	16·1	2·7	21·2	4·5	11·3	2·8
Vegetables	240·1	27·6	216·4	32·9	256·9	41·4	256·9	4·4	218·7	32·7	293·0	83·4
Legumes	18·1	4·5	18·4	8·1	18·0	5·4	22·5	3·5	18·3	4·2	26·4	5·6
Fruits	351·9	33·0	361·1	48·4	345·4	45·9	329·4	30·8	344·0	44·8	315·7	43·4
Meat	121·1	9·6	142·2	15·8	106·2	11·0	118·2	7·5	117·0	10·2	119·3	11·3
Fish	55·9	7·3	66·5	10·2	48·4	9·9	62·4	6·8	73·8	8·4	51·7	10·3
Alcoholic beverages	62·1	23·7	95·5	51·6	38·6	17·3	56·6	19·1	96·7	36·5	18·7	8·2
Non-alcoholic beverages	85·9	50·1	135·6	116·2	50·8	27·1	24·5	9·5	35·4	17·4	14·2	8·0
Water	1138·2	65·2	1204·3	119·7	1091·5	73·5	1009·4	48·8	1051·4	79·2	969·7	59·2

* For details of subjects and procedures, see Table 1 and pp. 259–260.

Table 3. *Energy and nutrient intakes of Spanish elderly grouped according to parental cause of death**

(Mean values with their standard errors)

Study group…	Subjects whose parents died of cardiovascular disease						Subjects whose parents died of other causes					
	Total		Males		Females		Total		Males		Females	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Energy (kJ/d)	7602	399	9024[b]	720	6599	238	6960	240	7218[b]	310	6716	376
Protein: g/d	77·4	3·0	86·5	4·6	70·9	3·0	77·1	2·4	76·8	2·9	77·3	4·0
% energy	17·2	0·6	16·7	1·02	17·6	0·8	18·9	0·6	18·1	0·7	19·7	1·1
Carbohydrates: g/d	236·4	18·4	271·6[b]	21·5	211·5	26·3	212·4	9·7	219·9[b]	11·7	205·3	15·3
% energy	46·9	1·5	47·6	1·3	46·5	2·5	47·8	1·4	48·1	1·9	47·6	2·0
Fat: g/d	70·1[a]	5·0	82·1[b]	9·2	61·6	4·4	57·9[a]	3·0	58·6[b]	3·4	57·2	5·0
% energy	33·9	1·3	33·6	1·6	34·1	2·0	31·3	1·1	30·9	1·5	31·8	1·7
PUFA: g/d	7·1	0·5	7·9	1·0	6·5	0·6	5·9	0·3	5·9	0·3	6·0	0·6
% energy	3·5	0·2	3·2	0·2	3·7	0·3	3·2	0·1	3·1	0·2	3·3	0·2
MUFA: g/d	33·5	2·8	39·0	5·3	29·6	2·6	28·8	1·5	28·9	1·6	27·2	0·4
% energy	16·3	0·8	15·7	1·1	16·6	1·0	15·1	0·5	15·2	0·7	15·1	0·8
SFA: g/d	21·4[a]	1·6	24·8[b]	2·9	18·9	1·6	15·7[a]	1·1	16·6[b]	1·5	14·9	1·7
% energy	10·5[a]	0·5	10·3	0·9	10·6[c]	0·6	8·6[a]	0·6	8·7	0·8	8·5[c]	0·8
PUFA:SFA	0·36	0·03	0·34	0·04	0·37	0·04	0·41	0·03	0·41	0·04	0·41	0·04
MUFA:SFA	1·62[a]	0·09	1·63	0·16	1·61	0·10	1·88[a]	0·09	1·88	0·12	1·88	0·15
Myristic acid (g/d)	1·75[a]	0·20	1·9[b]	0·3	1·7	0·3	1·2[a]	0·14	1·1[b]	0·2	1·3	0·2

Palmitic acid (g/d)	12·2[a]	0·8	13·9[b]	1·4	11·1	0·8	9·5[a]	0·6	9·8	0·8	9·1	0·8
Stearic acid (g/d)	4·7	0·4	5·5	0·7	4·2	0·4	3·9	0·4	4·3	0·7	3·5	0·4
Oleic acid (g/d)	31·8	2·7	36·7	5·2	28·3	2·5	27·2	1·5	28·2	1·8	26·2	2·4
Linoleic acid (g/d)	5·9	0·5	6·7	0·9	5·5	0·5	5·2	0·4	5·3	0·5	5·0	0·6
Cholesterol: (mg/d)	245·8	17·9	283·6	18·0	219·2	26·4	229·9	13·6	245·8	20·4	215·0	18·1
(mg/MJ)	137·6	9·6	138·3	12·8	137·0	13·9	140·4	8·2	145·2	12·0	135·9	11·5
Animal fat (g/d)	32·5[a]	3·0	36·3	5·7	29·8	3·2	24·4[a]	2·0	27·5	2·7	21·4	2·8
Vegetable fat (g/d)	36·1	3·6	40·2	7·5	33·2	3·3	31·7	2·2	32·5	2·4	30·9	3·7
Dietary fibre (g/d)	20·8	1·4	20·3	1·9	21·1	2·2	22·5	1·5	21·9	2·2	23·0	2·4
Ca (mg/d)	796·8	52·9	792·9	95·9	799·6	62·6	752·2	43·0	662·9	57·3	836·6	58·1
Fe (mg/d)	11·8	0·5	13·3	0·7	10·7	0·7	11·9	0·5	12·1	0·8	11·7	0·7
Zn (mg/d)	9·3	0·4	10·3	0·6	8·6	0·5	9·1	0·4	9·1	0·5	9·1	0·5
Mg (mg/d)	267·9	11·4	275·0	19·0	262·8	14·5	274·0	13·1	269·3	18·5	278·4	18·9
Thiamin (mg/d)	1·1	0·1	1·1	0·1	1·1	0·1	1·2	0·1	1·2	0·1	1·2	0·1
Riboflavin (mg/d)	1·4	0·1	1·4	0·2	1·4	0·1	1·5	0·1	1·3	0·1	1·6	0·1
Niacin (mg/d)	28·4	1·2	31·6	1·8	23·1	1·4	30·0	1·2	29·8	1·4	30·1	1·9
Folate (μg/d)	213·1	19·2	187·8	15·0	231·0	30·8	214·4	14·1	202·7	20·7	225·4	19·5
Vitamin B_{12} (μg/d)	5·3	0·9	5·4	0·9	5·2	1·5	7·1	1·4	7·0	1·9	7·2	2·2
Vitamin C (mg/d)	142·3	11·1	138·3	13·4	145·2	16·6	146·2	13·6	137·9	16·2	154·0	21·9
Vitamin A (μg/d)	737·4	55·1	764·7	79·0	718·1	77·3	950·6	166·0	852·9	174·7	1042·9	281·1
Vitamin D (μg/d)	2·3	0·4	3·1	0·7	1·7	0·5	2·3	0·5	2·1	0·5	2·5	0·8

[a,b,c] Mean values in horizontal rows with the same superscript letter were significantly different: $P < 0·05$.
PUFA, polyunsaturated fatty acids; MUFA, monounsaturated fatty acids; SFA, saturated fatty acids.
* For details of subjects and procedures, see Table 1 and pp. 259–260.

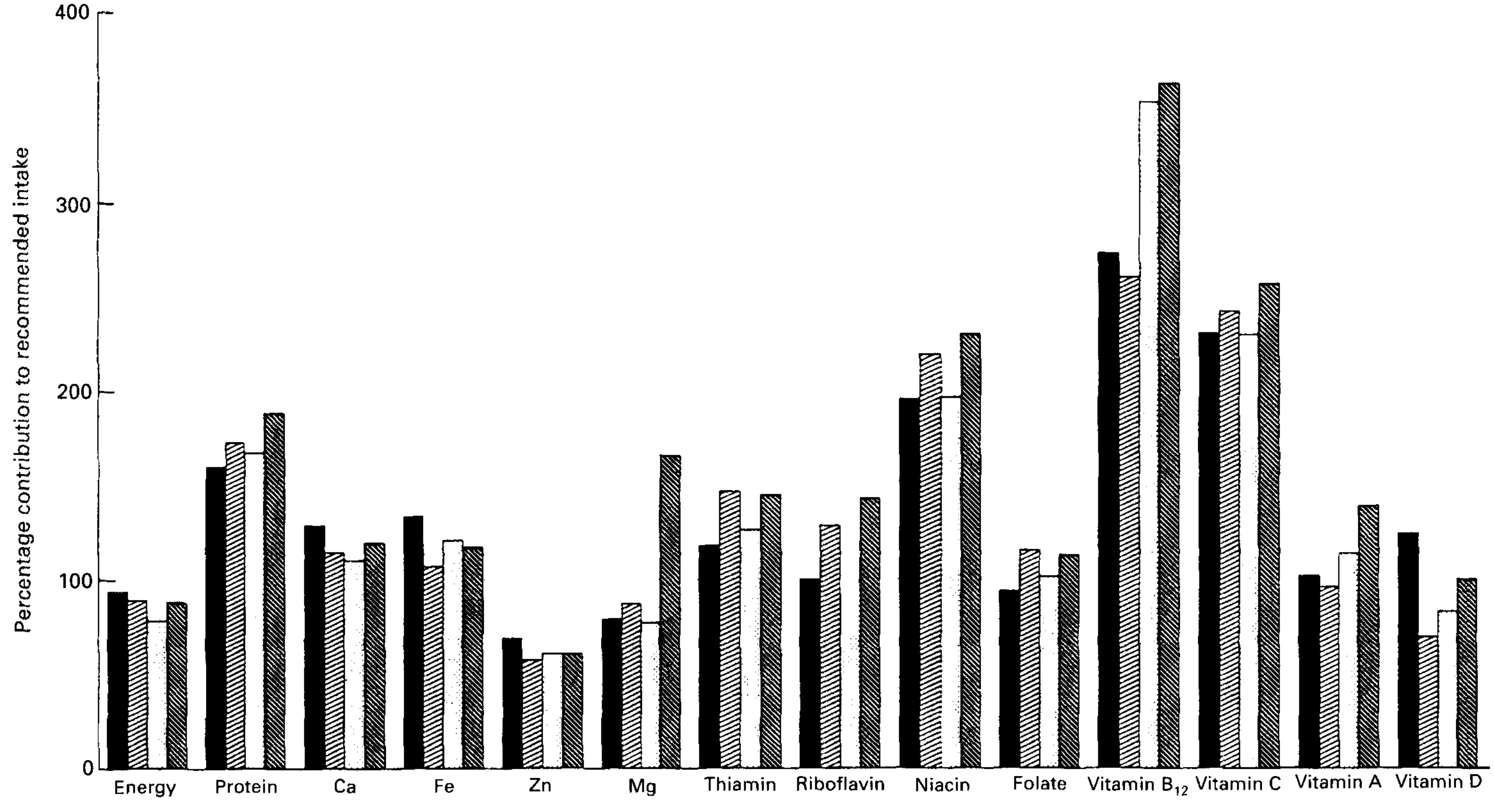

Fig. 1. Percentage contribution of energy and nutrient intakes of elderly Spanish subjects to recommended intakes (Institute of Nutrition, 1990*b*). (■), Male subjects whose parents died of cardiovascular disease; (▨), female subjects whose parents died of cardiovascular disease; (⬚), male subjects whose parents died of other causes; (▧), female subjects whose parents died of other causes. For details of subjects and procedures, see Table 1 and pp. 259–260. For details of energy and nutrient intakes, see Table 3.

C elderly had higher intakes of myristic ($P < 0.05$) and palmitic ($P < 0.05$) acids, slightly lower PUFA:SFA (not significant) and lower MUFA:SFA ($P < 0.05$) than group NC elderly.

Comparison within sex showed that group C males had higher energy ($P < 0.05$), carbohydrates ($P < 0.05$) and fat ($P < 0.05$) intakes than group NC males. There were no significant differences between females in groups C and NC.

DISCUSSION

In the elderly, hypertension is a major risk factor for cardiovascular disease (Nikkila & Heikkinen, 1990). Both the Framingham Study and the Chicago Stroke Study (Harris *et al.* 1988) have shown that untreated hypertension in older individuals is strongly associated with an increased risk of stroke and cardiovascular disorders (Tuck *et al.* 1988). Our finding that group C elderly had a higher mean diastolic blood pressure than group NC elderly (Table 1) is consistent with previous findings.

The results of the anthropometric study (Table 1) are similar to those found in other studies (Lemonnier *et al.* 1991). Although obesity has been considered to be a cardiovascular and hypertension risk factor (McCarron & Kotchen, 1983; Beilin, 1988), we did not find any difference in the Quetelet index between groups C and NC elderly. But the role of obesity as a cardiovascular risk factor is not as clear as that of some of the other factors (Alfin-Slater & Kritchevsky, 1990). To date obesity is seen as a cardiovascular risk factor, primarily because of its association with other risk factors such as hypertension, hypercholesterolaemia and diabetes (Harris *et al.* 1988).

Cholesterol and HDL-cholesterol levels were similar to those observed in other European elderly (De Groot *et al.* 1992), but were only slightly higher in group C elderly than in group NC elderly (Table 1).

The relationship between total energy intake and cardiovascular disease has been examined in several studies. Some authors have indicated that subjects who develop heart disease have a history of lower total energy intake, on average, compared with those who remain free of the disease (Lapidus *et al.* 1986). Other authors have found that total energy correlates positively with the mortality rates from coronary heart disease (Connor & Connor, 1986; Ginter, 1986; Williams *et al.* 1988; Nissinen & Stanley, 1989; Shah *et al.* 1990). In our study group C males had higher energy intakes than group NC males (Table 3). The results are similar to those obtained in several European countries by means of the EURONUT-SENECA study (De Groot *et al.* 1992). Also, in these populations men had higher energy intakes than women (De Groot *et al.* 1992).

The greatest differences in intakes between groups C and NC elderly were total fat, saturated fat and animal fat, which were higher among group C elderly (Table 3). Fat intake has been reported to be associated with hypercholesterolaemia and hypertension (McCarron & Kotchen, 1983; Beilin, 1988; Williams *et al.* 1988; Pietinen *et al.* 1989; Alfin-Slater & Kritchevsky, 1990) and also with a higher risk of mortality from coronary heart disease and stroke (Shimamoto *et al.* 1989).

Increasing PUFA:SFA has been suggested to reduce blood pressure (Puska *et al.* 1983). A negative association has also been demonstrated between increased consumption of MUFA and both systolic and diastolic blood pressure (Williams *et al.* 1987).

With regard to serum cholesterol, polyunsaturated and monounsaturated fats appear to be equally effective in reducing LDL-cholesterol levels when substituted for saturated fats in the diet. Their effect on HDL-cholesterol may differ, however. In metabolic ward studies using high-fat formula diets, polyunsaturated fats have reduced HDL-cholesterol, while monounsaturated fats have not (Dreon, 1990).

Based on these findings it is concluded that group NC elderly had a better status than group C elderly, since their PUFA:SFA ($P < 0.1$) and MUFA:SFA ($P < 0.05$) values tended to be higher than those of group C elderly (Table 3).

All saturated fatty acids may not have the same effect on plasma cholesterol levels. Stearic acid is less hypercholesterolaemic than other saturated fatty acids (Cobbs, 1992). The major cholesterol-raising saturated fatty acids in the diet are palmitic acid and myristic acids (Ginter, 1986; Grundy & Denke, 1990). Group C elderly had significantly higher intakes of both fatty acids than group NC elderly (Table 3).

The energy intakes from saturated fat of 51·7% of group C and 34·2% of group NC were more than 10% of the total energy intake; 75·9% of group C and 62·9% of group NC had fat intake higher than 30% of total energy intake. In addition, 38% of group C and 20% of group NC had cholesterol intakes higher than 300 mg/d. These target values (saturated fat < 10% total energy intake, fat < 30% total energy intake, cholesterol < 300 mg/d) are based mainly on what is widely considered to be an ideal nutritional pattern for the prevention of cardiovascular diseases (National Cholesterol Education Program, 1989). From these findings the dietary intakes of group NC elderly appear to be closer to the recommendations designed to prevent or treat cardiovascular disease (Connor & Connor, 1986).

Nutrient and energy intakes were similar to those found in other elderly people (Moreiras-Varela *et al.* 1986), although saturated fat and cholesterol intakes were slightly lower than those in other studies (Nes *et al.* 1992).

In our study there were differences between the intakes of group C and NC males, but not between group C and NC females. Although we need more data to determine whether there are sex differences, some authors recognize that women enjoy a natural relative immunity to coronary atherosclerosis compared with their male counterparts because of their sex hormone status, especially in the premenopausal years. Thus, it may be more important for men to adopt a behaviour that reduces their risk of coronary artery disease (hypertension, hypercholesterolaemia; Hazzard, 1989). Other authors (Plaza *et al.* 1990) indicate that the influence of parental death from cardiovascular disease on the serum lipid levels of their descendants is different depending on whether it was the father or the mother who suffered from cardiovascular disease, observing a greater influence if it was the father who died from cardiovascular disease.

It is clear that there are dietary differences between group C and group NC elderly which can determine cardiovascular diseases (Connor & Connor, 1986). Even though our study deals with elderly who have survived over 65 years without cardiovascular diseases and other pathologies, their dietary habits show differences with respect to their parents' cause of death. It is possible that there may be genetic or cultural factors (dietary habits learned during childhood) which favour cardiovascular disease, predisposing the individuals to follow a diet which favours the development of these pathologies (Brunzell & Austin, 1990; Rozin, 1990).

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