

Nutrition and Macrovascular Disease in the Elderly

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One might assume that, since the elderly are the survivors, the way they eat might be the preferred way. But attention to food intake in the elderly is often worthwhile. Macrovascular disease is a considerable problem, manifesting as coronary heart, cerebrovascular and peripheral vascular disease, and the potential for nutritional intervention is a challenge. There is, nevertheless, a considerable range of food intake patterns and of healthy profiles amongst the elderly and, of course, we do need to know more about these. In the meantime, there are useful recommendations that emerge from the following considerations.

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Risk Factors in the Elderly

Obesity

In the elderly, recognition of overfatness by weight-height relationships is compounded by decreased lean body mass with its own effects on weight, and loss of height due to osteoporosis. More direct measurement of fatness by skin fold thicknesses can be helpful.

An important contributor to these changes is decreased physical activity. With the decrease in physical activity goes a need for reduced energy intake which in itself may be an adverse risk factor for coronary heart disease and overall mortality. Although excess adiposity may not carry the same adverse risk in later life as in younger life, there remain the mechanical problems that obesity presents for maintenance of physical activity and general personal care. Obesity can also contribute to the other risk factors of hyperlipidaemia, impaired glucose tolerance and hypertension.

Hyperlipidaemia

The 30-year follow-up of the predictive power of total serum cholesterol in the US town of Framingham indicates that, of itself, it is not of value beyond the age of 50 [1]. However, it is worth noting that in an analysis of the MRFIT study for men aged 35 to 47 with a serum cholesterol level above 4.68 mmol/L (the 20th percentile of the serum cholesterol), coronary heart disease mortality increased progressively, as did total mortality [2]. Other evidence indicates that lipoprotein fractions predict coronary outcomes in later years - LDL adversely and HDL favourably [3,4].

In women in their 50s, serum triglyceride is a risk factor for coronary disease perhaps because of the kind of lipoprotein it represents. Consequently triglycerides should be less than 2.0 mmol/L. The tendency of serum total cholesterol to increase in postmenopausal women is often difficult to interpret without measurement of HDL cholesterol. Total cholesterol/HDL cholesterol ratios are probably best when less than 4.6.

Impaired Glucose Tolerance

The prevalence of impaired glucose tolerance and of diabetes increases with advancing years. Both constitute risk factors for macrovascular disease and various forms of cardiac disease including congestive heart failure. A fasting blood glucose concentration between 6 and 8 mmol/L indicates impaired glucose tolerance, and above 8 diabetes, although both need confirmation. Measurement of glycated proteins, e.g. glycated haemoglobin and fructosamine, can be helpful.

Hypertension

The rise often seen in systolic and diastolic blood pressure with age is not a necessary accompaniment of the ageing process. Blood pressure remains an important predictor of life expectancy at all ages.

Platelet Aggregation

This is emerging as an important determinant of macrovascular disease and its sequelae, although the evidence has come principally by examining factors which change it like aspirin and essential fatty acids (EFA) of the omega-3 variety. More work is required to examine platelet aggregation directly.

Smoking

At all ages smoking is an important risk factor for macrovascular disease in its various forms. It needs to be taken into account nutritionally because of its effects on appetite, taste and metabolic rate.

Altering Risk Factors in the Elderly with Food

Obesity

For the elderly, the most important strategy to prevent and manage obesity is regular physical

activity. This can: avoid precariously low food intake and allow maintenance of lean body mass with its important contribution to basal metabolic rate; contribute to a lower blood pressure; increase HDL cholesterol concentrations; improve glucose tolerance and have favourable psychological effects. Where energy intake needs reduction, energy dense items with low essential nutrient density should be reduced. These are principally the fatty foods (37 KJ/g or 9 calories/g), alcohol (29 KJ/g or 7 calories/g), beverages and food which are made principally of refined carbohydrate (16 KJ/g or 4 calories/g). Emphasis should be on unrefined carbohydrate, lean meat and fish, and low fat dairy products.

Hyperlipidaemia

It is often appropriate to encourage reduction in saturated fat from animal sources in the elderly, and this can contribute to lower serum total cholesterol levels. The retention of some monounsaturated (e.g. olive oil) or polyunsaturated fat (from plant or fish sources) may further assist lowering LDL cholesterol and maintaining acceptable HDL cholesterol concentrations. Food or beverage factors other than fat (e.g. coffee) may be important insofar as serum lipids and coronary risk are concerned [6].

Factors which need to be taken into account in giving this advice include:

1. Whether or not there has been loss of lean body mass or a wasting condition, problems not uncommon in the elderly
2. Whether there has been any inexplicable fall in serum total cholesterol [1]
3. The impact of a major shift in food culture or habits – usually not a problem with saturated fat where low fat alternatives are available.

Impaired Glucose Tolerance/Diabetes

Here, glucose intolerance can be improved with an increase in unrefined carbohydrate to more than 50% of energy and a decrease in fat to 25 to 30% of energy intake over an extended period of time (days or weeks). Where excess body fat is present, strategies for dealing with obesity also need

to be in place. Spreading the sources of carbohydrate through the day and being regular in food intake are consistent with the prevention of macrovascular disease [7].

Hypertension

There are several nutritional strategies here which are at least as relevant in the elderly as for younger age groups:

1. Reduction in body fatness
2. Decreased sodium/potassium ratio
3. Moderation with alcohol
4. A more vegetarian orientation.

Platelet Aggregation

Evidence is accumulating that an increased omega-3 polyunsaturated fatty acid intake, principally from fish but also obtainable from the structural fat of lean meat, can reduce platelet aggregation. This will probably reduce atherogenesis and arterial thrombosis while potentially being of wider nutritional importance [8]. A decrease in serum total cholesterol and triglycerides may also be seen. It is worth noting that fish eating communities in Scandinavia, Japan, and around the Mediterranean, have among the world's best life expectancies.

Smoking

As smoking is ceased, patients need to be encouraged to take steps to avoid a possible increase in body fatness, e.g. by having low energy density snacks and by maintaining regular physical activity. A particular source of confusion for many is the belief that the risks of obesity are greater than the risks of cigarette smoking when, of course, the reverse is true.

General Nutrition

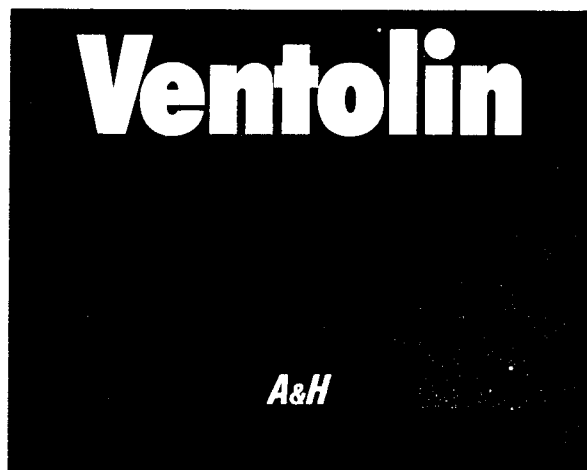
All the dietary changes suggested to reduce risk factor profiles for macrovascular disease are ones which improve the overall nutritional quality of food eaten by elderly people.

Other nutrition-related disorders seen amongst

elderly people need not be compromised – osteoporosis, bowel disorders, nutrient deficiencies with drug interactions, and more.

Other Health Benefits

The social function of eating and, in turn, its impact on health, are undoubtedly of great importance [9]. In whatever meal programmes are arranged for the elderly, whether self-prepared, meals on wheels at elderly Citizen's clubs, or eating out elsewhere, these considerations are of moment.



Recommendations

1. Increase physical activity as a first step in any nutrition programme for the elderly
 2. Decrease the energy density of food unless there is a wasting state
 3. Increase the nutrient density of food
 4. Decrease the sodium/potassium ratio of food
 5. Encourage moderation in the use of alcohol.
- Such steps are of general health and, potentially, of specific cardiovascular benefit.

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