

IN THIS EDITION

The impact of dietary changes: decreased cardiovascular diseases in Finland.

The North Karelia Project in Finland was launched in 1972. Dietary, pharmacological and other interventions aimed mainly at reducing the cholesterol and blood pressure levels, controlling obesity and increasing physical exercise.

Unfortunately, since 1975, obesity and physical inactivity have increased. However, remarkable improvements in two of the recognized major risk factors of cardiovascular diseases, i.e. blood pressure and serum cholesterol levels, have taken place.

DIETARY CHANGES HAVE DECREASED CARDIOVASCULAR DISEASES AT WORLD-RECORD RATE IN FINLAND

Heikki Karppanen, M.D., Ph.D., Professor of Pharmacology, Institute of Biomedicine, University of Helsinki

In Finland the death rates from both heart attacks (Coronary Heart Disease, CHD) and strokes have decreased dramatically, by approximately 75 % since 1975.



The North Karelia Project in Finland was launched in 1972 in response to the local petition to get urgent and effective help to reduce the burden of

exceptionally high coronary heart disease and stroke mortality rates in the area. In cooperation with local and national authorities and experts as well as with WHO, the North Karelia Project was formulated and implemented to carry out a comprehensive intervention through the community organizations and the action of the people themselves.

Fundamental role of lowered blood pressure and important contribution of cholesterol lowering effect

The Project comprised intensification of conventional medical therapies and population-wide efforts to change the diet and reduce smoking. Dietary, pharmacological and other interventions aimed mainly at reducing the cholesterol and blood pressure levels, controlling obesity and increasing physical exercise.

Unfortunately, since 1975 there have been

unfavourable developments in several of the factors, which are believed to increase the risk of cardiovascular diseases.

Obesity and physical inactivity have increased, and the consumption of alcohol has also markedly increased.

While smoking has moderately decreased among men, it has increased among women. In spite of this, the percentage decrease of the cardiovascular diseases has been as big among women as among men.

However, remarkable improvements in two of the recognized major risk factors of cardiovascular diseases, i.e., blood pressure and serum cholesterol levels, have taken place. The population average of blood pressure has decreased remarkably: systolic pressure approximately 15 mm Hg and diastolic pressure about 12 mm Hg.

According to several prospective studies, a 12 mm Hg fall in the average diastolic blood pressure can be expected to decrease the death rate from strokes by 70 % or more. Hence, the decrease in blood pressure obviously has been the factor or, at least, the most important factor, which has produced the decrease in the stroke mortality. On the basis of prospective studies,

the observed fall in the average blood pressure and the approximately 1.1 mmol/l decrease in the population average of serum cholesterol levels may have contributed almost equally to the decreased death rates from heart attacks

Salt (sodium) reduction with increased intakes of potassium and magnesium have lowered the blood pressure

The main factors explaining the observed fall of population blood pressure are the marked, approximately 30-35 % decrease in the average intake of sodium (salt), and increases in the intakes of potassium and magnesium. The increased amounts of potassium and magnesium have been derived both from the increased intake of vegetables and the use of the potassium-, magnesium-, and lysine-enriched Pansalt (“mineral salt”). The use of vegetables has increased approximately 3-fold during the past 30 years. The current international recommendations for the prevention and basic treatment of elevated blood pressure emphasise the need to reduce the intake of salt (sodium), and to increase the

intakes of potassium, calcium and magnesium (“DASH-salt Diet”). Replacement of the use of common salt with Pansalt so that the daily intake of salt is decreased by 30 % (from 10 grams to 7 grams a day), increases the intake of potassium by 1830 mg.

This increase is in excellent agreement with the current recommendations of 1800 to 1900 mg increases in the daily potassium intakes.

The recommended intake of potassium for adolescents and adults is 4700 mg a day, while the current average intakes in USA have been found to be as low as 1750 mg only. The INTERSALT study has shown that, also in most other communities the average potassium intakes are less than half of the recommended level of 4700 mg.

The usual intakes of sodium in most industrialised countries are approximately 4000 mg a day, which correspond to 10 grams of salt (sodium chloride). The most liberal authorities recommend the reduction of salt intake to 7 grams a day (2800 mg sodium). However, the most recent science-based Dietary Reference

Intake (DRI) for sodium is only 1500 mg a day. Hence, the current intakes exceed approximately 3-fold the DRI.

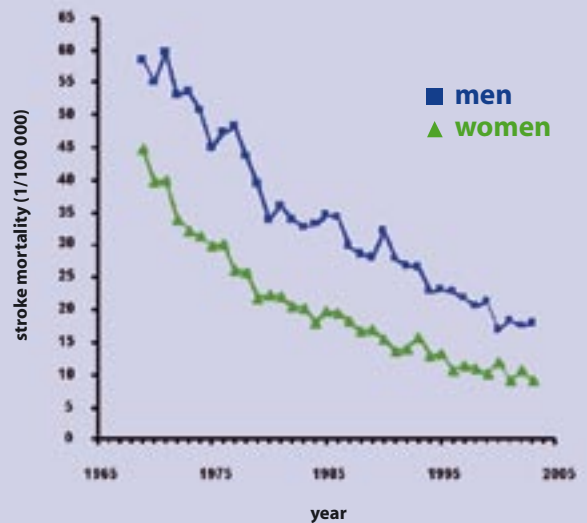
The invention and launch of “mineral salt” (Pansalt), a good-tasting potassium-, magnesium-, and lysine-enriched, sodium-reduced (43 % less sodium) salt in 1980s in Finland, created in the media big interest both in salt and in the beneficial minerals. The interest was further enhanced by studies demonstrating that the use of foods, which contained Pansalt instead of common salt, had a good blood pressure lowering effect alone, and also markedly improved the effect of blood pressure lowering medication.

A marked decrease in the home use of salt has taken place since 1980s, and the common salt in home kitchens has been to a marked extent replaced by Pansalt. In early 1990s the government launched a salt labeling legislation. To avoid “This is a high salt product” warning labels, and under pressure from the media, the food industry made major changes in the salt, potassium, and magnesium composition of different commonly used

FIGURE 1
CHD mortality in Finland
1969-2003 (15-64 years)



FIGURE 2
stroke mortality in Finland
1969-2003 (15-64 years)



food items. Currently, products with reduced salt and fat are also eligible for "Better choice" and/or "Pansalt" logos, which are tempting for consumers. Among numerous other companies, even McDonald's in Finland has replaced the use of common salt with Pansalt.

Changes in dietary fats have lowered serum cholesterol levels

Due to a remarkably decrease in the use of butter and normal-fat milk, the intake of milk fat has decreased by 70-80 %. The milk fats and other hard animal fats have been partly replaced by vegetable margarines and oils. The use of plant sterol-enriched margarines, which have a well-documented cholesterol lowering effect, have apparently also contributed to the lowering of the average serum cholesterol levels in the Finnish population.

Minor population influence of blood pressure and cholesterol lowering drugs

Since 1975, drug treatment of hypertension and later also that of elevated serum cholesterol has been intensified in the whole country by special programs and reimbursement of the costs of drugs. Like in other countries, even in Finland it has been generally believed that the intensive drug therapies have largely accounted for the observed favourable changes in blood pressure, serum cholesterol and, ultimately, in cardiovascular diseases.

However, extensive studies have shown that the long-term effect of antihypertensive drugs is not more than a 5-6 mm Hg fall in the diastolic blood pressure. Such a fall in the drug-treated individuals, which have comprised less than 10 % of the population, is "diluted" to an approximately 0.5 mm Hg fall in the average blood pressure of the population. Hence, the above-mentioned dietary factors have

produced approximately 95 % (11.5 mm Hg) of the observed total fall (12 mm Hg) in the average diastolic blood pressure. The increases in obesity and alcohol intake have obviously contributed towards elevation of the blood pressure and weakened the effects of the favourable changes in the intakes of salt and beneficial mineral nutrients.

The relative influence of cholesterol lowering drugs on the average cholesterol levels in the population has been even smaller than the influence of antihypertensive drugs on average blood pressure levels has been. First, the fall of the average cholesterol levels took place during a period when the use of cholesterol lowering drugs was very rare. Until the early 1990s, less than 1 % of the population received cholesterol lowering drugs. It can be calculated that, even if drug therapy reduced serum cholesterol to a zero level (by approximately 7 mmol/l) in all treated individuals, such a decrease in 1 % of the population would produce a 0.07 mmol/l decrease only in the population average. In reality, of course, the real drug effect has been considerably smaller, approximately 0.01 mmol/l only. Second, from 1995 to 2004 the use of cholesterol lowering drugs has increased 15-fold, so that approximately 8 % of the Finnish population received statins for reduction in cholesterol in 2004. Surprisingly, the average cholesterol levels have not continued to decrease after 1995. The average cholesterol levels have even slightly increased since 1997 among men, and remained essentially unchanged among women. Therefore, the observed decrease in the average cholesterol levels has been almost completely due to non-drug factors.

It should be emphasised that, although the overall impact of blood pressure and cholesterol lowering drugs on the population health has proved to be surprisingly small, they are often highly beneficial and crucially important for the small number of patients with the highest risk.

However, as evident from the Finnish experience, population strategies should be mainly based on dietary rather than pharmacological approaches.

Possibilities for further improvements

Since 1995 the average cholesterol levels have not continued to decrease. There are also indications that the rate of favourable changes in the salt, potassium, and magnesium contents of industrially manufactured foods is decreasing. This situation emphasises the need for new, innovative approaches such as enrichment of different food types with cholesterol lowering plant sterols and, simultaneously, blood pressure lowering changes in the mineral nutrient composition. The mineral composition improvements comprise potassium- and/or calcium- and/or magnesium-enrichments, and even sodium reduction in foods, which contain added salt. The use of such foods with healthy multi-active compositions may offer a major new weapon for further improvement in the control of several of the most detrimental public health problems.

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NEWS

The 2006 International Symposium on Atherosclerosis (ISA)

The 2006 International Symposium on Atherosclerosis (ISA) will be held in Rome, Italy on June 18-22, 2006.

This symposium wants to update physicians and other health care professionals on the most recent research breakthroughs and innovative clinical applications.

The target audience is clinical researchers and practising physicians involved in lipid disorders and in the management and treatment of cardiovascular disease, especially those in the fields of cardiology, lipidology, endocrinology, internal medicine, neurology and geriatrics.

More information: www.isa2006.org

The Alpro Foundation is organising a satellite symposium on Wednesday June 21, 2006: "Dietary approaches for atherosclerosis prevention: vegetable protein"

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For more information:

Alpro Foundation VZW
Vlamingstraat 28
8560 Wevelgem
Belgium

T +32 (0)56 43 22 11
F +32 (0)56 43 22 06
info@alprofoundation.org

www.alprofoundation.org