A “natural experiment” in cardiovascular epidemiology in the early 21st century


Despite similar traditional risk factors, morbidity and mortality rates from coronary heart disease in western and non-western cohorts remain substantially different. Careful study of such cohorts may help identify novel risk factors for CHD, and contribute to the formulation of new preventive strategies.
Concentrations of total cholesterol did not differ by age. It was observed in Japanese men in Japan that the CHD mortality in Japanese men in Japan is likely to be substantially lower than in US white men. Men in Japan and Japanese American men in Hawaii remain similar to those among Japanese men in Japan. Nonetheless, CHD mortality rates in the post-war birth cohort in Japanese men in Japan and Japanese American men in Hawaii remain substantially lower than in US white men (fig 1).

Numerous factors can be postulated to explain such a difference in disease rates in these populations. CHD mortality in Japanese men in Japan is likely to be underestimated because of misclassification of death from CHD into heart failure. Nonetheless, conservatively assuming that 50% of heart failure cases were caused by CHD, mortality would remain substantially lower than that among US white men. Varying "lag time" between exposure to risk factors and disease occurrence is unlikely to explain the difference. Concentrations of cholesterol in this post-second world war birth cohort of US white men and Japanese men in Japan were very similar in the 1970s. Stepwise decrements of concentrations of total cholesterol which begins at the age of 12 was observed in both white boys in the USA and boys in Japan, and the mean concentrations of total cholesterol did not differ by 0.13 mmol/l between white boys in the USA and boys in Japan in every age from 9 to 15 years where the data are available.

**TRADITIONAL RISK FACTORS**

The levels of traditional risk factors are likely to have been similar between Japanese American men in Hawaii and US white men at that time. Very high consumption of omega-3 fatty acids from fish, isoflavonoids from soy products, and alcohol in the Japanese men may account for some of the difference in atherosclerosis formation and CHD morbidity and mortality. It is also possible that specific genetic polymorphisms differ among these populations and may interact with environmental factors. Reported variation in cholesterol ester transfer protein polymorphisms may affect both high density lipoprotein cholesterol concentrations and atherosclerosis. Variations in lipoprotein size, distribution, and particle concentration are related to atherosclerosis and CHD, independent of lipid concentrations. These factors may be affected by genetic polymorphisms of enzymes such as lipoprotein lipase or hepatic lipase and may be influenced by certain environmental factors such as lack of exercise and diets leading to central obesity.

Other opportunities for study in such populations include subclinical atherosclerosis measurements such as coronary calcification detected by electron beam computed tomography, and intimal–media thickness of the carotid artery measured by ultrasound. Evaluating and comparing the extent and severity of subclinical atherosclerosis and its relation to various risk factors for CHD might afford the identification of novel risk factors for CHD. Indeed, the careful evaluation of the post-second world war birth cohorts that have adopted traditional western lifestyles may provide new evidence for specific "protective factors", either genetic or environmental, and may be a more powerful epidemiological tool than longitudinal studies in relatively homogeneous populations.

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**REFERENCES**


IMAGES IN CARDIOLOGY

Multiple cystic aneurysms in aortitis demonstrated by three dimensional volume rendering images of multislice computed tomography

A 29 year old man presented with slight fever and pulsation at the left neck originating from a gradually expanding palpable mass. Multislice computed tomography (CT) (Aquilion, Toshiba, Tokyo, Japan) was performed with a 1 mm slice thickness, helical pitch 5.5, and 100 ml of iodinated contrast material (300 mg/ml) delivered intravenously at a rate of 3 ml/s. An aneurysm in the left common carotid artery (LCCA) with a mural thrombus was revealed. The aortic arch, proximal portion of the descending aorta (DA) and ascending aorta (AA) appeared to be separated, as if indicating dissection of the lumen. Three dimensional volume rendering images showed collateral arteries around the anterior region of the neck and a cystic lesion from the distal aortic arch to the proximal DA after which the peripheral part of the aorta heads rightward, then downward. In axial source images at this level, the lumen of the distal portion of the aortic arch and proximal portion of the DA appears separated. Cut plane volume rendering images show distal and proximal portions of the LCCA aneurysm. Stenosis and post-stenotic dilation in the proximal portion of the left subclavian artery (LSA) are observed. Multiple cystic lesions are shown at the inferior border of the aortic arch, which in the axial images (panel D, left) appeared as aortic dissection. Thus, three dimensional volume rendering images showed the presence of multiple cystic aneurysms, but not aortic dissections. CT and blood serum studies indicated inflammation and enabled the diagnosis of aortitis, and steroid therapy was started.

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Viewpoint