Mini Review

“Japan Diet” and Health—The Present and Future

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Summary Japan achieved remarkable economic development after World War II, which has led remarkable changes in risk factors of atherosclerotic diseases and led to epidemiological transition in Japan. Nowadays, obesity is pandemic around world, which is same case in Japan. BMI of Japanese population, especially young adult men increased gradually since the 1960s associated with increase in intake of fat as well as decrease in intake of rice, which has been revealed by the annual report of the Ministry of Health, Labour and Welfare. Such changes suggest the change of dietary habit from Japanese style to westernized style. In recent years such changes in lifestyle has been accompanied by a gradual increase in serum cholesterol in the Japanese population, which is associated with increase in the incidence of cardiovascular diseases (CVD). Japanese guidelines recommend “The Japan diet” to prevent CVD, because there are several epidemiological data to show the cardio-protective effect of fish, soy bean, and vegetables, which are the major component of “The Japan Diet”. It is very important to recognize the diet habit is one of culture and that rice plays a pivotal role in “The Japan Diet”.

Key Words Japan diet, life style, cardiovascular disease, epidemiologic change

Japan has achieved remarkable economic development after World War II, and the associated urbanization caused marked changes in the living environment, which has led to nutritional improvement. Such improvement has reduced neonatal death and infectious diseases such as tuberculosis, which was major cause of death after World War II, leading to rapid decrease in death rate (1) as shown in Fig. 1.

Around 1960, leading cause of death in Japan was apoplexy, mainly cerebral bleeding. Hypertension is well known as a major risk factor for apoplexy, and high salt intake is also well known as one of risks of hypertension. Salt intake was over 20 g/d at that time in Japan. Restriction of salt intake was recommended as a population-based approach to hypertension, leading to reduction of blood pressure level and so of the death rate of apoplexy (1) as shown in Fig. 2.

However, westernization of lifestyle has also caused increases in the obese, dyslipidemic, and diabetic populations after 1980. Hypertension also changed from the salt-dependent type to hypertension accompanied by metabolic abnormalities, consequently, with marked changes in the pathology of stroke, i.e., from cerebral bleeding and lacuna type to athero-thrombotic cerebral infarction. After around 1985 Japanese death rate has been increasing again as shown in Fig. 1.

Recent Trend of Cardiovascular Disease of Japan

The incidence of ischemic heart disease (IHD) is particularly low until 2000 in Japan. However, we are now witnessing a recent gradual trend toward higher incidence of IHD (4) as shown in Fig. 5. In recent years a combination of economic recovery and a shift toward more Westernized lifestyle have been accompanied by a gradual increase in serum cholesterol in the Japanese population (5) as shown in Fig. 6. Meanwhile, a population-based approach to hypercholesterolemia in the US has been accompanied by a decrease in American cholesterol levels (6) and a reduced death rate from myocardial infarction (7). These changes have

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narrowed the difference in the IHD death rate between Japan and US (8) as shown in Fig. 5.

Nowadays, obesity is so called pandemic around world, which is same case in Japan. BMI of Japanese population, especially of young adult men increased gradually since the 1960s associated with increase in intake of fat and meats as well as decrease in intake of rice and fish (8) as shown in Fig. 7.

Japanese guidelines for prevention of atherosclerotic diseases recommend “The Japan diet”. “The Japan Diet” is defined by Japan Atherosclerosis Society (JAS) as follows, more fish and other seafood products, and soy as well as less animal meat, poultry and dairy foods than in Western countries. The recommendation of the guideline is based on Japanese own evidences. There are several epidemiological data to show the cardio-protective effect of fish, soy bean, and vegetables, which are the major component of “The Japan Diet” (9) as shown.

Figure 8 shows evidence of the cardio-protective effect of fish. Almost every day intake of fish will reduce the incidence of myocardial infarction by 56% as compared with the people eating fish only one day per week (10).
Nagasawa SY et al., also reported that serum n-3 fatty acids levels were much greater in Japanese than in American, and that both carotid intima media thickness and coronary artery calcification were reduced in the Japanese compared with American even though Japanese had similar life-time cholesterol and blood pressure levels as American, in the study ERA-JUMP (11), which is a cohort study of post-World War II Japanese men and white men in the U.S. The authors conclude that high intake of n-3 fatty acids has anti-atherosclerotic effects.
One recent RCT conducted in Japan, the Japan EPA Lipid Intervention Study (JELIS) (12), revealed that the incidence rate of coronary artery disease was significantly lower in patients treated with combination of statin and n-3 fatty acid than those with statin–monotherapy. This study has leaded the conclusion that n-3 fatty acid, fish oil, has cardio-protective effects.

We have also several epidemiological evidences, which showed cardio-protective effects of other typical Japan diets such as soybean and soybean products.

Figure 9 shows the effect of soy-products on CVD. Intake of much soy-products reduced the risk of CVD by 61% in women but not in men (13).

**Trials of Japanese Diet**

Maruyama et al. conducted a pilot study to clarify the effects of Japan diet on metabolic risk factors for atherosclerotic diseases in middle-aged men. They recruited thirty-three young men and recommended the Japan Diet (more fish, soybeans and soy products, vegetables, seaweed, mushrooms and unrefined rice and so on), and were encouraged to consume the Japan Diet for 6 wk. Such education resulted in improvement in more than 1 cardiovascular risk factor in 91% of the participants (14).

Nakamura et al. reported the effects of traditional Japanese diet on all-cause mortality and cardio-vascular mortality with use of large scale-cohort study: NIPPON
Table 1. Lifestyle Modification for the Prevention of CVD.

| 1. Stop smoking and avoid passive smoking |
| 2. Refrain from overeating and maintain an ideal body weight |
| 3. Reduce intake of meat, dairy products and egg yolk and increase the intake of fish and so\(4\) products |
| 4. Increase intake of vegetables, fruit, unrefined grain and seaweed |
| 5. Reduce intake of food containing too much salt |
| 6. Avoid excessive alcohol consumption |
| 7. Perform aerobic exercise for at least 30 min daily |

DATA 80. At baseline in 1980, data were collected on study participants aged \(\geq\) or \(=\) 30 y. They defined a measure of a healthy reduced-salt Japanese diet based on seven components from FFQ. The total score ranged from 0 to 7, with 0 being least healthy and 7 being most healthy. Participants were divided into approximate tertiles of dietary scores. They followed 9,086 participants for 29 y. There were 1,823 all-cause and 654 cardiovascular deaths during the follow-up. With the dietary score group 0–2 serving as a reference, the Cox multivariate-adjusted hazard ratios for groups of all-cause and CVD death mortality revealed significant reduction trend according to the scores (15).

Based on such evidences JAS guideline recommended life style for prevention of atherosclerotic diseases (16) as shown in Table 1.

Role of Rice in Japanese Diet

To date, however, we do not have any studies, which show rice itself is more beneficial for prevention of cardio-vascular diseases. Although we don’t have any rigid evidence that rice itself is protective for atherosclerotic diseases, “The Japan Diet” is protective for the diseases and rice is a pivotal player in “The Japan Diet”.

Thus, we recommend “The Japan Diet”, which is based on combining staple food, mainly rice, with soup, and side dishes made from fish, vegetable, Tofu and so on.

It is important to recognize the Diet habit is one of culture and that rice plays pivotal role in Japanese cuisine.

Disclosure of State of COI

No conflicts of interest to be declared.

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