Preventive Medicine Efforts in Japan Focusing on Metabolic Syndrome


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Abstract
Japan’s aging population and rapid advances in medical technology have caused an increase in the nation’s health expenditures, resulting in a rapid increase in the share of medical care costs borne by insured patients, a critical social issue that requires some sort of countermeasure. In this regard, the Ministry of Health, Labor and Welfare has recently extended its disease control measures toward the promotion of preventive medicine aimed at reduced health costs. More specifically, the ministry is taking action to control diabetes mellitus, hypertension, and lipid metabolism disorder, mainly through the modification of people’s lifestyle habits, and thereby to prevent cardio- and cerebrovascular disorders that severely impair vital prognosis and quality of life. With metabolic syndrome used as a key target, a new approach to health promotion has been enacted: insurers are obliged to carry out specific health checkups of insured persons aged 40 years or older to detect signs of lifestyle-related diseases as early as possible. They should also provide specific health guidance, if appropriate, to prevent the clinical manifestation of lifestyle-related diseases. To this end, an innovative preventive measure has been taken, focusing on metabolic syndrome, with the use of waist circumference as an indicator, a method that is simple to employ and easy for anyone to understand.

Key words  Metabolic syndrome, Lifestyle-related diseases, Preventive medicine, Healthy Japan 21, Health promotion measures

Introduction
This communication describes the status of metabolic syndrome in preventive medicine in Japan, where currently there is lively ongoing discussion as to health system reform. According to statistical data reported by the mass media (Ed. Nikkei Inc.: Revitalization of medical care services: a document of crisis in the field of clinical practice. 2003), about 85% of Japanese people are concerned about health system reform, with 50.4% fairly interested and 34.1% somewhat interested in the disputed issue of health system reform.

Japan assures its citizens free access to health services under its universal health insurance coverage. Health care is available to Japanese people at the lowest cost among developed nations. Japan’s universal health care system is one of the world’s preeminent health care systems. A large segment of the public, however, is not necessarily content with the current system and is seeking reform.

Why Is Health System Reform Needed?
Japan has seen declining birthrates with an increasing proportion of elderly people as well as extreme advances in medical technology. A technique of microsurgery with minute manipulations using robot technology is now being applied to various conventional surgical operations. Along with such advances in medical technology, health care has become more complex, in need of more physicians and nurses and huge investments in equipment, resulting in increased health care...
costs. However, when there was high economic growth, the increase in health care costs, even if striking, was absorbed by the country’s economic growth and hardly reflected in a burden on the population. The share of the cost to insured persons increased from zero to 10%, with health care for the elderly continuing to be free, representing the provision of health care as a humanitarian service. In this climate, patients were not unhappy with the paternalistic one-way provision of health care, assuming that there would be no problems if patients followed physicians’ advice.

However, when economic growth slowed, causing limits to be placed on the proportion of the national budget allocated to health expenses, the share of costs borne by the insured increased from 10% to 20% and eventually to 30%, and elderly patients were required to contribute some portion of the cost of health care they received. Prior to that change, people had felt that health care should be supported by insurance fees and taxes. As a result, the comparatively low financial burden, as compared with other countries, gave the impression of a heavy burden, and caused changes in people’s view of health care. Japanese people’s awareness of human rights has been growing, leading to requests for a change from conventional physician-dictated health care to patient-centered care and for containment of increasing health expenses.

However, given the fact that medical care costs were actually increasing to the point where the nation’s capacity was limited, the government began to recognize that efforts should be focused on actions that could be taken before a problem developed, i.e., disease prevention rather than simply treating patients who were already ill. This point of view is the one we have long advocated, and the government finally has recognized its benefits.

The Political Shift from Treatment to Prevention

In the background of the political shift to prevention, lies Japan’s aging society and decreasing number of children. This situation has caused a rapid increase in health expenses for the elderly, resulting in an increased burden on the people. Lifestyle-related diseases for which aging is a risk factor are now responsible for two-thirds of deaths and account for more than one-third of national health expenses.

Recent years have seen increases in deaths from cancer, cerebrovascular disorders, ischemic heart disease due to atherosclerosis, and, more recently, pneumonia. Since atherosclerosis is a lifestyle-related disease, there is a possibility that its onset may be delayed by improving lifestyle habits. It has been said that current cases of death from pneumonia correspond to former cases of death from senility, and may be possible to formulate a disease structure in which pneumonia ranks as a major cause of death in the elderly. In fact, society has come to feel that health and longevity are indispensable in establishing a healthy, vigorous, aging society.

Atherosclerosis-derived diseases are related to several risk factors. If obesity, hypertension, diabetes mellitus, hyperlipidemia (dyslipidemia), etc., are combined, the risk of such diseases is multiplied. A person who has 3–4 risk factors has a risk 31.3-fold higher than those with no risk factor (Fig. 1). Therefore, controlling these risk factors may make it possible to prevent the development of atherosclerosis.

According to yearly changes in individuals who have concurrent risk factors for metabolic syndrome, the incidence of stroke (cerebral hemorrhage) decreased gradually with decreasing salt intake after 1961, a time when smoking and alcohol consumption were also decreasing. However, in contrast, obesity, hypercholesterolemia, and impaired glucose tolerance increased rapidly,
calling for measures against lifestyle-related diseases that would help eliminate obesity and control metabolic disorders. According to data on annual health expenses for individuals who underwent and who did not undergo regular medical checkups in Kumamoto Prefecture (Fig. 2), medical expenses for those who underwent health checkups were nearly half the health expenses for those who did not undergo health checkups. It is therefore considered that regular health checkups followed by recommendations for improving diet and exercise if necessary may be able to rein in overall health care costs.

In countries outside Japan, measures against lifestyle-related diseases have been taken since the 1960s. According to the Centers for Disease Control and Prevention (CDC) in the US, the number of deaths from coronary artery disease was cut in half: from 542.9 to 266.8 in men and from 263.3 to 134.4 in women per 100,000 population during the two decades from 1980 to 2000. The decrease was particularly prominent in men and women of younger generations. Since the preventive benefit of measures against lifestyle-related diseases is not easily achieved in the elderly, controlling the development of such diseases in the younger generation is important. The US has been successful in such efforts. One of the factors contributing to the decrease in deaths has been advances in treatment. For example, mortality from acute myocardial infarction was 25–50% in the past, but is currently less than 10% owing to intensive treatment in CCU. Another contributory factor is the control of risk factors, with the control of lifestyle habits contributing as much as half of the success. The success rates have been documented with scientific evidence, e.g., with a 7% contribution from smoking cessation and 12% contribution from exercise.

Japan’s Policies of Disease Prevention and Health Promotion

Following the efforts of the US and UK, the Ministry of Health, Labor and Welfare (MHLW) of Japan set up the health promotion project “Healthy Japan 21” in 2000. In this project targeting lifestyle-related diseases and causative lifestyle habits, numeric goals were set for 120 items in 9 areas (nutrition/eating habits, physical activity/exercise, rest/mental health, tobacco use, alcohol consumption, dental health, diabetes

![Graph showing changes in health expenses for persons who underwent and those who did not undergo health checkups.](Cited from material of President Emeritus Koyama W, Japanese Red Cross Kumamoto Health Care Center)
mellitus, cardiovascular disease, and cancer). The Japanese government began a health promotion campaign as a national movement to achieve its goal in 10 years. In 2002, the government enacted the Health Promotion Law to construct a framework for further aggressive facilitation of health promotion and disease prevention for its people.

However, in terms of the goals specified for the major items in “Healthy Japan 21” by 2005, the percentage of obese males aged 20–60 years, which was 24.3% at the time the goal was set (in 2000) was scheduled to be 15% or less by 2010. However, in actuality, the interim assessment in 2005 revealed no decrease, but rather an increase to 29.0% instead. Both walking steps per day and number of persons undergoing breast cancer screening were below the baseline. However, daily salt intake was decreased by the spread of a low-salt diet, in parallel with a slight decrease in the prevalence of hypertension. Dental care was also improved, resulting in an increase in the proportion of people who maintained their own teeth at an age-appropriate level.

Thus, as a whole, the interim assessment of “Healthy Japan 21” showed a decrease from the baseline rather than improvement in most of the 120 items. This is a serious problem. In contrast to the success of controlling lifestyle-related diseases in western countries, no comparable success has been achieved in Japan. Therefore, the Japanese government considered that support from the private sector would be necessary as well as the involvement of public administration, and the “Act for Assurance of the Medical Care for the Elderly” was established in 2006. Under this act, the implementation of specific health checkups and specific health guidance targeting insured persons and their non-working dependents aged 40–74 years has been mandatory since April 2008. Attention is now focused on the question as to whether these efforts are truly effective.

Strategic Study on the Prevention of Diabetes Mellitus (J-DOIT)

In addition to “Healthy Japan 21,” the MHLW newly launched a strategic study to prevent diabetes mellitus, J-DOIT (Japan Diabetes Outcome Intervention Trial). J-DOIT began in 2005, and was scheduled to continue for 5 years, with funding of 860 million yen. J-DOIT consists of three different studies: an intervention study to reduce by half the transition from borderline impaired glucose tolerance to diabetes (J-DOIT1), an intervention study to reduce by half the percentage of patients withdrawing from treatment (J-DOIT2), and an intervention study to suppress by 30% the progression of diabetic complications (J-DOIT3); these studies are underway in cooperation with local medical associations.

The purpose of J-DOIT2, a study that examines percent withdrawal from treatment, is targeted to obtain evidence as to how effectively the progression of diabetes is suppressed by preventing patients’ withdrawal and their continuation of treatment, in diabetic patients who have hardly any subjective symptoms and tend to stop receiving treatment halfway.

On the other hand, in J-DOIT3, intensive treatment to strictly control blood glucose, blood pressure, and lipids is carried out in patients with type-2 diabetes to investigate effective treatments for the prevention of diabetic complications. More specifically, although there has been a conventional preventive medical approach to the modification of lifestyle habits, this study is designed to accumulate scientific evidence as to what actually is effective and how effective it is, and to further promote preventive medicine. Dr. Yasuhiko Iwamoto is taking an active part in the steering committee guiding this study.

When impaired glucose tolerance is found in health checkups, the subject’s data are kept in the data center. An accelerometer, which records the amount of exercise, is lent to the person, who then measures the amount of exercise and body weight every day. These measurement data are collected and sent to the data center to quantitatively evaluate how to achieve actual benefits. This evaluation is ongoing in 2,000 subjects. When the results are obtained, we think that certain scientific evidence can be provided against extreme arguments that there is no basis for the idea that preventive medicine lowers medical care costs.

Changes in Health Awareness

In recent years, people’s awareness of health has changed greatly. Although Japan ratified the WHO Framework Convention on Tobacco Control in 2004, there has been a steady increase in smoking rates, including those of minors. Japan Tobacco, Inc. (JT) has advocated that smoking is
a Japanese tradition, and views tobacco as a luxury item for adults. However, an understanding that tobacco is a noxious agent that carries health risks has recently spread to the general public.

In light of this trend, metabolic syndrome has become a key word and has played a very important role. Although there may be continuing controversy about the pathogenic and pathophysiologic mechanisms of metabolic syndrome, waist circumference is easy to measure, unlike blood tests, and is used as a simple index of obesity or accumulation of visceral fat. More people are now concerned with bulging waistlines, suspecting that they may have “Metabo (metabolic syndrome).” Formerly, being plump conveyed the image of wealth and high living, whereas now introduction of the concept of metabolic syndrome has led to the idea that being plump carries the risk of disease.

Although it may be difficult for the general public to accept the warning when they are informed of the possibility that hypertension, diabetes, and dyslipidemia induce various diseases, in this regard, metabolic syndrome is a key word that is straightforward and has contributed largely to raising health awareness. Although Japanese people’s awareness of health is less advanced than in many other countries, it is hoped that lifestyle-related diseases and related deaths will decrease within 10–20 years, as has been the case in western countries.

**Conclusion**

Beginning next year, insurers will be obliged to carry out specific health checkups of insured persons, focusing on lifestyle-related diseases, and to provide specific health guidance if appropriate. In health guidance, it is important to have the person at risk recognize his or her own medical risk factors and feel a sense of crisis that motivates lifestyle modification (Fig. 3). The concept of metabolic syndrome has contributed greatly to raising this awareness. As a next step, behavioral objectives should be tailored to each individual in the process from behavior modification based on a sense of crisis to the establishment of habit modification.

It is expected that finely-tuned responses to insured persons and others will be taken in the future to protect the health of each person living in this country, and that effective preventive medical projects or health promotion projects will be established as in western countries.