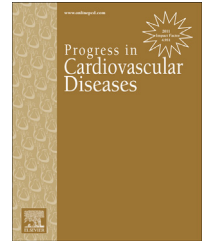


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Current State of Cardiac Rehabilitation in Japan

Yoichi Goto*

Department of Cardiovascular Rehabilitation, Department of Cardiovascular Medicine, National Cerebral and Cardiovascular Center, Suita, Japan

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ABSTRACT

In Japan, metabolic risk factors have been increasing due to the westernization and urbanization of lifestyle. This justifiably raises a concern that the incidence of coronary heart disease (CHD) in Japan will increase over time, and indeed, recent epidemiological studies in Japan suggest the incidence of acute myocardial infarction (AMI) is increasing. Cardiac rehabilitation (CR) in Japan has been traditionally performed in the inpatient setting. To obtain reimbursement, a CR facility must fulfill certain criteria including being a medical institution with a cardiology/cardiac surgery section which has at least a cardiologist/cardiac surgeon and an experienced CR physician as full-time employees. These criteria create challenges to the availability of outpatient CR after hospital discharge. A recent analysis found outpatient CR participation rate was estimated to be between 3.8 and 7.6% in Japan. This review describes recent trends in the incidence of AMI and the current status of the use of CR in Japan.

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Cardiovascular diseases (CVD), and in particular coronary heart disease (CHD), are a major cause of death in the United States (US) and European countries. In recent decades, the incidence and mortality of both CVD and CHD have been declining in most of these countries.^{1,2} This decrease in CHD mortality has been attributed to improvements in medical treatments and more effective management of CHD risk factors.² However, in Japan, metabolic risk factors have been increasing due to the westernization and urbanization of lifestyle.³ For example, in a population-based cohort study in Hisayama, the age-adjusted prevalence of hypercholesterolemia has substantially increased from 2.8% to 25.8% in men and from 6.6% to 41.6% in women from 1961 to 2002.⁴ This justifiably raises a concern that the incidence of CHD in Japan will increase over time. Because cardiac rehabilitation (CR) in Japan has been traditionally performed in the inpatient setting, implementation of outpatient CR after hospital

discharge remains insufficient. In this review, an overview of recent trends in the incidence of acute myocardial infarction (AMI) and the current status of the use of CR in Japan will be presented.

Incidence and mortality of CHD in Japan

Trends in CVD and CHD mortality and CHD risk factors in Japan

The annual report of the Organization for Economic Cooperation and Development (OECD) indicated that Japan and Korea have extraordinarily low mortality rates for CHD compared to other countries; age-adjusted mortality rates per 100,000 of the population in 2009 were 38 in Japan and 37 in Korea compared with 128 in the US, 123 in Canada and 110 in

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* Address reprint requests to: Yoichi Goto, MD, PhD, Department of Cardiovascular Medicine, National Cerebral and Cardiovascular Center, 5-7-1 Fujishirodai, Suita, Osaka 565-8565, Japan.

E-mail address: ygoto@hsp.ncvc.go.jp.

Abbreviations and Acronyms

AMI = acute myocardial infarction

CABG = coronary artery bypass graft

CR = cardiac rehabilitation

CVD = cardiovascular disease

CHD = coronary heart disease

JCAD = Japanese coronary artery disease

JCS = Japanese Circulation Society

OECD = Organization for Economic Co-operation and Development

PCI = percutaneous coronary intervention

US = United States

Germany.⁵ However, according to data from the Japanese Ministry of Health, Labor and Welfare, Japan is demonstrating an increase in crude mortality (unadjusted for age) from CVD and a decrease in stroke mortality from 1950 to 2010 (Fig. 1). Even though the mortality rate from CVD in Japan remains comparatively low, the increasing trend in CVD mortality is in contrast to the decreasing trend in the US.¹

Because the Japanese society has been aging in recent decades, the true impact

of CHD on premature death has to be assessed in the context of age-adjusted mortality. Indeed, the age-adjusted CHD mortality in Japan has gradually declined from approximately 50 per 100,000 in 1980 to 30 per 100,000 in 2006.⁶ Comparatively, while other OECD countries have also enjoyed a steady decline in CHD mortality collectively during that same time period, the rate is still higher compared to Japan; ~80 per 100,000 overall.⁶ This decreasing trend in Japan has also been shown in the national data for both men and women since

the 1970s, and has been attributed to the corresponding decreases in systolic blood pressure and smoking rates.³

However, considering that a decrease in CHD mortality can be the result of either a decrease in incidence or an improvement in survival due to advances in treatment, the observed decline in CHD mortality does not directly indicate a decrease in CHD incidence in Japan. In fact, the smoking rate remains much higher in Japan than in the US, and serum cholesterol levels, the prevalence of diabetes/glucose intolerance and obesity have steeply increased from the 1960s to the 2000s^{3,4,7} (Table 1). Moreover, national data from US and Japan suggest that total cholesterol levels in the Japanese population have increased to levels similar to those in the US population; mean serum total cholesterol level in Japanese adults ≥ 30 years of age was 203 mg/dL in 2000 while that in US adults ≥ 20 years of age was 204 mg/dL in 1999–2000.^{1,8}

Increasing trends in incidence of AMI in Japan

Along with worsening CHD risk profiles, Kitamura et al⁹ reported that the incidence of CHD has increased in a select portion of the Japanese population, i.e., middle-aged working males (aged 40–59 years) living in an urban area (Osaka). This indicates that we need comprehensive registry data covering a community over time to accurately monitor CHD incidence in Japan.

Table 2 summarizes recent reports on the trends of AMI incidence in Japanese cohorts. There are two population-based (community-based) cohort studies^{7,10} and three hospital-based registry studies.^{11–13} Two studies^{7,12} compare cohorts from the 1960–70s and the 2000s, two^{10,11} compare cohorts from the 1990s and the 2000s, and the remaining one¹³ compares more recent cohorts (2004 and 2011). Although the Hisayama study⁷ did not show any increase in AMI incidence over 40 years, its statistical power may not be high enough to detect changes given the small number of events (15 and 34 AMIs for the two time periods, respectively). Moreover, one population-based study¹⁰ and two hospital-based studies^{11,12} comparing cohorts from 1979 to 1997 and the 2000s showed consistent increases in AMI incidence in Japan. This increase in AMI incidence contrasts to the gradual decline in CHD mortality since the 1970s as reported by national statistics in Japan.^{3,6} The apparent discrepancy between the increasing AMI incidence and the decreasing CHD mortality may be explained by an increasing AMI incidence being offset by an improvement in medical treatment, resulting in an overall decline in mortality.

Very recent trends suggesting a decrease in incidence of AMI in Japan

It is of note that the Kumamoto study¹³ indicated a decrease in AMI incidence in the most recent 2011 cohort compared to a 2004 cohort. Although a statistical significance was reached only in men ($p = 0.029$), women and the total population also had p -values close to statistical significance ($p = 0.051$ and 0.053 , respectively). This finding is in accordance with a very recent Korean study where the incidence of AMI has decreased in 2010 compared to 2006.¹⁴ Taken together, it may be suggested that the AMI incidence in Japan has

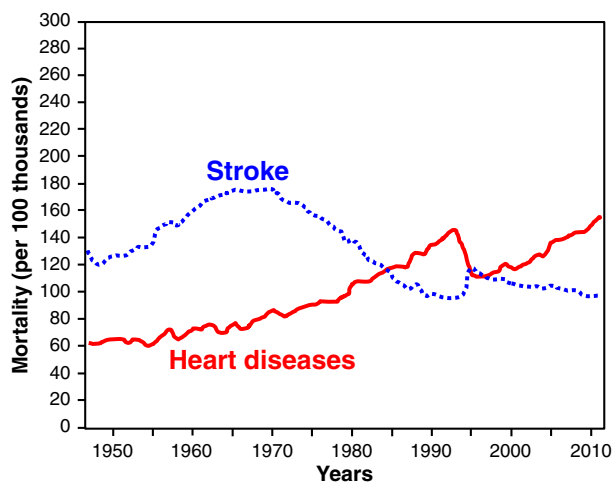


Fig. 1 – Cardiovascular disease mortality trends in Japan in 1947–2011. The abrupt decrease in heart disease mortality and concomitant increase in stroke mortality in 1995 was caused by the change in diagnostic criteria in death certificate in Japan. Adapted from the Japanese Ministry of Health, Labor and Welfare, 2012 (at <http://www.mhlw.go.jp/toukei/itiran/>).

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