Burden of Cardiovascular Disease in Asia: Big Challenges and Ample Opportunities for Action and Making a Difference

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Cardiovascular disease (CVD) is the leading cause of death in the world, accounting for 30% of deaths globally. The major cardiovascular diseases include coronary or ischemic heart disease, cerebrovascular disease or stroke, hypertension, heart failure, and rheumatic heart disease. Although the CVD mortality rate has declined in the US and the rest of the developed world, the rate has increased in the developing world, including most Asian countries. The estimated number of deaths due to CVD worldwide was 17.5 million in 2005 and will increase to 20 million in 2015. Further, Asian countries have disproportionately high morbidity and mortality from stroke compared with Western countries. These unique patterns of CVD deserve more attention, because half of the world’s population lives in Asia.

The December themed issue of *Circulation* highlighted reviews and original studies on risk factors, prevalence, awareness, treatment, control, mortality, and secular trends of CVD in Asia with a specific focus on China, India, Japan, and Korea. As pointed out in the editorial comment in that issue of *Circulation*, the relationship between traditional risk factors and CVD is different in Asia than in Western societies, and there are some unique features about risk factors and metabolic abnormalities for CVD in Asia (1). For example, hypertension plays a more important role in the development of heart disease and stroke in Asia than in Western countries. The prevalence of obesity and overweight in Asia has been increasing as a consequence of economic development in the past two to three decades. The rate of increase for diabetes has been even more substantial. Mean cholesterol levels are lower for adults in most Asian countries than in Western countries, but an increasing trend has been observed. Genetic predisposition and the interaction between genetic and environmental factors also contribute to the difference in CVD between Asians and people living on other continents.

Awareness, Treatment and Control of Risk Factors

Despite the fact that up to two thirds of CVD can be attributable to hypertension, the rates of awareness, treatment, and control of hypertension in most Asian countries remain low. It is estimated that only 24% of hypertensive patients in China are aware of their condition. Of those who are aware, 78% are treated, but only 19% are adequately controlled. In Japan, the stroke rate has declined over the past 40 years owing to the control of hypertension, partly by lower salt intake and better management. In most Asian countries, however, the importance of high salt intake in the population is not well recognized, and there is limited action to reduce salt consumption by the general public. One study suggested that lowering sodium intake by 100 mmol a day, from 170 mmol (about 3800 mg) to 70 mmol (about 1500 mg), is associated with a reduction of 3–6 mmHg in systolic blood pressure. Another study has shown that a 5-mmHg decrease in mean systolic blood pressure in the population could result in 14% fewer stroke deaths, 9% fewer coronary heart disease (CHD) deaths, and 7% fewer deaths due to all causes. Reduction of salt intake in these countries could substantially lower the risk of developing stroke and CHD and save lives.

The marked increase in the prevalence of obesity, overweight, and type 2 diabetes largely reflects changes in diet and physical activity levels as a result of economic development, industrialization, and urbanization. This increase has posed enormous challenges to Asian societies and healthcare systems. It is worth noting that increased visceral adipose tissue in the presence of normal body mass index appears to be a common feature in at least some Asians, particularly South Asians.
The rate of cigarette smoking remains high for Asian men, and the rate for women has increased. According to the INTERHEART study, 9 traditional risk factors collectively accounted for approximately 90% of the population-attributable risk of CVD (2), although there is some disagreement about the estimate.

**Incremental Value of Novel Biomarkers**

The importance of novel biomarkers including genetic markers for CVD has been widely explored in the past decade or two. The National Academy of Clinical Biochemistry (NACB) has recently published the Laboratory Medicine Practice Guidelines (LMPG) on emerging biomarkers for primary prevention of cardiovascular disease (3). These biomarkers include lipoprotein subclass and particle concentration, lipoprotein, apolipoproteins A-I and B, high-sensitivity C-reactive protein (hsCRP), fibrinogen, white blood cell count, homocysteine, B-type natriuretic peptide (BNP), N-terminal pro-BNP (NT-proBNP), markers of renal function, and many others. Whether some of these biomarkers have stronger or weaker associations with CVD in Asians than in other populations warrants further investigation. Appropriate statistical methodologies (4) need to be developed and applied to more accurately assess the incremental value of a biomarker in disease risk prediction and clinical utility. This also opens up a sizeable opportunity for biochemists. The challenge is how to improve the performance of these assays and how to standardize them. The usefulness of an assay will be limited without standardization.

**What Can Be Done?**

Treating risk factors and overt diseases using medication and behavioral counseling at the individual level is important to address the problem we are facing. Lack of awareness of risk factors and disease, limited access to medications and care, and the high cost associated with treatment prevent us from achieving the goal of controlling these risk factors and the disease. The recently published results from the Indian Polycap Study (TIPS), a large phase II randomized trial that assessed the effects of 9 different pills containing either one or a combination of several generic and inexpensive drugs for risk factors such as high blood pressure and cholesterol, has the appeal of addressing the cost issue. Novel approaches such as web-based self-management of risk factors and assessment of risk of disease can have impact because of the increasing number of people in these countries with internet access. However, getting to the root of the problem (i.e., why these risk factors are increased) remains pivotal to reducing the burden.

Compelling evidence has indicated that population- and public policy–based approaches to prevent the development of these risk factors and CVD are the most important and effective strategy in reducing the burden of the disease and can have lasting effect. These specific approaches could include the following:

1. Restricting access to tobacco products by increasing excise taxes and enforcing smoking bans.
2. Increasing access to tobacco-cessation services, while concurrently reducing client out-of-pocket costs for these services.
3. Reducing the amounts of sodium in foods that are processed, manufactured, or served in restaurants, while promoting access to farmers’ markets and grocery stores that offer fresh fruits and vegetables.
4. Reducing saturated and trans fats in the diet and minimizing the intake of food and drinks that are sugar-sweetened by working with restaurants, bakeries, food and beverage manufacturers, schools, and governing agencies.
5. Creating opportunities for physical activity, such as walking and biking trails and other open spaces for recreation, while providing incentives to engage in physical activity in schools, worksites, and communities.
6. Working with insurers to develop health benefits packages that provide coverage for clinical services to control high blood pressure, high blood cholesterol, high blood glucose/diabetes, and obesity.

**The Need for Better Surveillance**

Last, but not least, better surveillance systems for CVD are essential to the success of efforts to reduce the burden of CVD. Public health surveillance is defined as “the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health” (5). Data disseminated by a public health surveillance system can be used for immediate public health action, program planning and evaluation, and formulating research hypotheses. Most Asian countries have sufficient disease-specific mortality data. But accurate national data on incidence and prevalence of CVD and its risk factors are very limited. Efforts are already underway to improve the CVD surveillance systems in Asian countries, but more work is necessary.

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