Epidemic Burden of Cardiovascular Disease in Indonesia

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Abstrak

Transformasi luar biasa di bidang ekonomi dan urbanisasi telah mengubah struktur demografi sosial di Indonesia sehingga menyebabkan pergubungan besar dalam pola makan dan penyebab kematian. Sebagai penyebab kematian utama, epidemic penyakit kardiovaskuler telah menjadi masalah kesehatan masyarakat yang serius. Masalah menjadi lebih sulit dengan adanya beban ganda penyakit yakni penyakit-penyakit tidak menular menjadi lebih menonjol sementara penyakit-penyakit menular masih belum teratasi karena sanitasi lingkungan yang buruk akibat tidak baiknya sistem pelayanan kesehatan. Penyakit kardiovaskuler sangat berhubungan dengan beberapa faktor risiko yang dapat diubah, seperti kebiasaan merokok tembakau, perubahan gaya hidup (makanan yang tidak sehat dan kurangnya aktivitas fisik), dan kelebihan berat badan/kegemukan. Strategi dengan target individu-individu berisiko tinggi dan upaya pencegahan berlandaskan populasi jelas sangat dibutuhkan untuk menghadapi beban epidemi penyakit kardiovaskuler, disamping menyediakan pelayanan kesehatan baku bagi penduduk Indonesia. Semua strategi ini harus disertai adanya keinginan politik untuk mendukung perubahan kebijakan kesehatan yang dipertukkan. Tulisan ini memberikan gambaran singkat tentang beban epidemi penyakit kardiovaskuler di negara-negara berkembang seperti Indonesia, dengan penekanan pada faktor-faktor risiko penting maupun strategi pencegahan dan pengendalianya.

Kata kunci: Penyakit kardiovaskuler, faktor risiko, pencegahan

Introduction

For centuries, communicable diseases have dominated the main cause of death. Uncontrolled epidemics have often limited the human life expectancy. After the Second World War, due to medical research achievements in terms of vaccination, antibiotics, and improvement of life conditions, non-communicable diseases (i.e. cardiovascular disease) have become a major problem and real burden for healthcare system. For a while, cardiovascular disease was associated with economic development in the developed countries and so called disease of the rich. But, by the dawn of the third millennium, cardiovascular disease have appeared sweeping the entire globe with an increasing trend in the developing countries, thus, constituting a serious public health problem.¹

This trend can be best explained by the paradigms of demographic transition as developed by Warren Thompson around 1930² and epidemiologic transition as described by Abdel Omran around 1970³, presented as evolutionary frameworks driven by social and economic changes that had profound effects on living habits. Apart from sharp shifts in demographic patterns and lifestyle change resulted from urbanization and industrialization, the globalization constituting the tailwind of the 20th century has propelled the developing countries into the epidemic of cardiovascular
disease. The transition reflects both a demographic shift toward increasing life expectancy and a shift in nutrition. In the developing countries, it imposes more constraints to deal with the double burden of disease, in which non-communicable diseases become more prevalent while communicable diseases remain undefeated due to poor environment as a consequence of ill-health care system.\

Indonesia, like many other developing countries, is facing the same problem. Since mid 1960s, a remarkable transformation in economy and urbanization has changed the social demographic structure. It contributed to large shifts in overall dietary patterns (from dietary deficit and food insecurity to over-consumption), followed by concurrent and possibly related shifts in the causes of death. Indeed, changes in the leading cause of death from communicable diseases to non-communci-cable diseases have occurred significantly since mid 1980s. Among the non-communicable diseases, death from cardiovascular disease has been dramatically accelerating. Cardiovascular disease was the leading cause of death accounting for 9.7% of all mortality in 1986 and 16.4% in 1992, but by 2001 it had risen to 26.3%. Importantly, recent study from the Indonesian Ministry of Health in 2007 has showed that 31.9% of all mortality was related to cardiovascular disease (stroke, hypertension, and heart diseases). Changing in demographic ageing has rapidly occurred. Life expectancy has increased from 42 to 47 years for men between 1967 and 1996, and 62 to 66 years for women. In 2005, the life expectancy increased to 66 years for men and 69 years for women; while in 2007, it became 67 years for men and 71 years for women.

Facing this situation, effective and efficient strategies for prevention and control of the risk factors of cardiovascular disease are, therefore, obvious and urgent. Otherwise, Indonesia will be unable to provide the inhabitants with a standard health care. The present article describes a brief overview on the epidemic burden of cardiovascular disease in the developing countries such as Indonesia, focusing on its important risk factors and strategies for prevention and control.

Cardiovascular disease

Cardiovascular disease is the name for a group of disorders which affects the heart and blood vessels. They include hypertension (high blood pressure), coronary heart disease (heart attack), cerebrovascular disease (stroke), peripheral vascular disease, heart failure, rheumatic heart disease, congenital heart disease, and cardiomyopathies. Cardiovascular disease constitutes the major cause of mortality and morbidity among the non-communicable diseases. Currently, 80% of deaths and 87% of disability due to cardiovascular disease occur in the developing countries such as Indonesia. Its burden is expected to further increase significantly over the next decades. It causes twice as many deaths as HIV, malaria, and tuberculosis combined. Given the highly direct and indirect annual costs related to cardiovascular disease, the economic implications of this problem are important for the sustainability of many developing countries.

Important risk factors

The increased burden of cardiovascular disease in the developing countries is resulted from increased prevalence of risk factors (which many are modifiable) and a relative lack of access to adequate interventions. The costly and prolonged care of cardiovascular disease often divert the scarce family and societal resources to medical care. As a result, the lower socioeconomic groups have greater prevalence of risk factors, higher incidence of disease, and higher mortality. Tobacco smoking, lifestyle change (unhealthy diet and physical inactivity), and accompanying overweight/obesity are responsible for at least 75% of cardiovascular disease, mainly
through their effects on blood pressure, blood sugar, and cholesterol.\textsuperscript{13}

**Tobacco smoking**

In the 20\textsuperscript{th} century, approximately 100 million people died worldwide from tobacco-associated diseases. The rising tobacco smoking patterns in the most developing countries contrast sharply with the overall decline in the developed ones. In the developing countries, tobacco smoking is increasing by nearly 3.4% per annum. Today, 80% of the 1.2 billion tobacco smokers in the world live in poorer countries where tobacco smoking prevalence among men is about 50%. The number of tobacco smokers among the women and adolescents has been substantially increasing. Fifty percent of the 5 million deaths attributed to tobacco smoking in 2000 occurred in the developing countries is responsible for the increase in deaths by more than one million during the last decade. Tobacco smoking remains the most important avoidable risk factor. It increases the risk of dying from cardiovascular disease by 2-3 fold.\textsuperscript{14,15} Recently, the prevalence of daily tobacco smoking among Indonesian population aged >10 years was found nearly 24%.\textsuperscript{5}

**Lifestyle Change**

With urbanization, there is a marked increase in consumption of energy-dense foods, poor in dietary fiber and several micronutrients, a decrease in energy expenditure (through less physical activity), and a loss of the traditional social support mechanisms. In addition to increased migration of individuals from rural to urban areas, rural areas are themselves being transformed. For example, increased mechanization in agriculture and increased use of automobile and bus transportation in rural areas lead to a decrease in physical activity. Physical inactivity was found in 48.2% of Indonesian population aged >10 years.\textsuperscript{6} Concomitantly, global influences (via television or increased availability of processed food) on lifestyle (perceived to be desirable or modern) change the types of food consumed in both urban and rural areas.\textsuperscript{16} Indeed, up to 80% cases of cardiovascular disease could potentially be avoided through lifestyle change. It was estimated that in high-risk populations, an optimum fish consumption of 40-60 grams per day would lead to approximately a 50% reduction in death due to cardiovascular disease. A recent study based on data from 36 countries demonstrated that fish consumption might reduce the risk of death from all causes as well as cardiovascular disease. Unfortunately, fish consumption remains very low. Daily intake of fresh fruit and vegetables in adequate quantity (400-500 grams per day) is recommended to reduce the risk of cardiovascular disease. But once more, this is thwarted by the western lifestyle which is invading the developing countries.\textsuperscript{15,17}

**Overweight/Obesity**

Obesity and dietary habits represent potential risk factors for cardiovascular disease, especially in the absence of physical activity. Overweight/obesity leads to adverse metabolic change such as insulin resistance, increasing blood pressure and cholesterol. Consequently, they promote cardiovascular disease. Worldwide, overweight affects 1.2 billion, of which 300 million are clinically obese. More and more children are suffering from overweight/obesity. However, the most contrasting phenomenon is to find over-weight/obesity and malnutrition side by side in the developing countries, and hence contributing to the growing burden afflicting these countries. In Indonesia, the prevalence of malnutrition among children aged <5 years was 18.4%, while overweight/obesity was 16.5%. Among schooling-aged children (6-14 years), the prevalence of underweight was 13.3% in boys and 10.9% in girls, while overweight was 9.5% in boys and 6.4% in girls. The prevalence of underweight among people aged ≥15 years was 14.8%, while overweight/obesity
was 19.1% (13.9% in male, 23.8% in female). In a study in West Sumatra, the short decade and a half period of rapid economic growth (1983-1999) and related shift in the labor force from agriculture to industry and services, have increased food availability, reduced food expenditures as a percent of income, and more than doubled the percentage of dietary intake from fat, from 9.1% in men and 12.1% in women to 23.2% in men and 23.6% in women. In other respects, it is estimated that 60% of the world's population do not do enough physical activity. Strategies for prevention and control

The large contribution of some important modifiable risk factors to the epidemic of cardiovascular disease has been discussed, and the need to reduce these risk factors is clearly a common goal of any prevention and control strategy. Generally, a dual approach is considered: screening and treatment of high-risk individuals while fostering population-wide preventive activities, starting in childhood, to reduce risk factor levels in the entire population. Reducing individual susceptibility to cardiovascular disease through reducing blood pressure, blood cholesterol and tobacco smoking has extremely strong supporting evidence from many randomized trials. On the other hand, interventions such as lifestyle modification of diet, exercise, and tobacco smoking targeted at individuals (through nicotine replacement therapy) are now a common inclusion in any public health policies.

Given the limited healthcare resources in the developing countries, a more cost-effective approach is to base treatment decision on each individual's risk of a cardiovascular event in the foreseeable future. This approach enables the selection of those that are in the greatest need and most likely to benefit from treatment through risk stratification and improves health outcomes. This includes people with established coronary heart disease, cerebrovascular disease, peripheral vascular disease, and other types of heart disease; diabetes and nephropathy; genetic lipid disorders such as familial hypercholesterolemia; no apparent cardiovascular disease but at high risk of developing atherosclerotic disease because of markedly elevated single risk factors (i.e. total cholesterol ≥ 8 mmol/L or blood pressure ≥ 180/110 mm Hg); no apparent cardiovascular disease but at high risk of developing atherosclerotic vascular disease due to a combination of cardiovascular risk factors; and metabolic syndrome.

Prescribing diuretics, β-blockers, and aspirin for the high-risk individuals are examples of intervention that are highly effective (reducing risk of cardiovascular disease by 20-40%) and fairly inexpensive. Other highly effective medications (i.e. ACE inhibitors and statins) should be eligible for broader use in the developing countries as they become off patent and expectedly less expensive. Some essential health care and low-priced medications for cardiovascular disease should be available at primary health center. By all means, the implementation of locally relevant high-risk individual’s interventions for cardiovascular disease will call for the development of appropriate diagnosis and treatment guidelines, relevant training for health professionals, and the need to reform and reorganize health systems, inclusive by their financing mechanisms.

Ironically, from a strategic perspective, it must be recognized that interventions targeting only high-risk individuals will have very limited impact on the total burden of cardiovascular disease at the population level because most cardiovascular disease in a population arise from many individuals who have only moderately elevated risk factor levels – the so-called ‘prevention paradox.” As such, it is essential that population-wide strategies are used to shift the risk distribution of the whole population to the left, and that high-
risk individual's strategies are used to deal with those at very high risk and for whom drug treatment may be indicated. These preventive strategies are complimentary and synergistic, and dovetail into each other in terms of targeting risk groups.

Focusing on the population wide prevention approach of cardiovascular disease is necessary to shift risk levels downwards. Such strategy includes implementation of World Health Organization's tobacco control convention and reduction of dietary salt intake through voluntary agreement with food industries. The combination of population-based cholesterol reduction strategies with interventions to reduce salt intake at the population level was found to be very cost-effective in all settings. Other attractive population-wide strategies include health education through mass media focusing on blood pressure, cholesterol, and body mass index, as well as promoting fruit and vegetable intake through national education campaigns.

The prime population-based strategy to control tobacco consumption is centered on taxation policy. Other non-price-related public measures are restrictions on tobacco smoking in public areas, public health education, and advertising bans. Policy measures can also include the abolition of subsidies for the production of animal products, incentives to increase the availability and affordability of vegetable and fruit products, setting up mass sports facilities and recreational areas in urban settings to increase lifelong physical activity, inclusion of health education programs and physical exercise classes within the regular school curriculums, and measures to empower the vulnerable or particular subpopulations (i.e., improved participation of women in leisure physical activities). Policies at regional or local levels can be highly relevant, i.e., for the preservation of traditional diets (low in fat and rich in fiber) in some areas or the consumption of fish in island and coastal communities.

The essential components of any control program of cardiovascular disease should include: establishment of efficient systems for estimation of burden related to cardiovascular disease and its secular trends, estimation of the levels of established risk factors of cardiovascular disease (i.e., tobacco smoking, elevated cholesterol, or blood pressure) in representative population samples to help identify risk factors that require immediate intervention, evaluation of emerging risk factors (i.e., glucose, abdominal obesity, fibrinolytic status, homocysteine) that may be of special relevance to the targeted populations, identification of the determinants of health behavior that influence the levels of both traditional and emerging risk factors in the specific context of each society, and development of a health policy that will integrate population-wide strategies for risk modification and cost-effective case management strategies for individuals who have clinically manifested cardiovascular disease or are detected to be at a high risk for developing.

Conclusion

Cardiovascular disease becomes more and more prevalent in the developing countries such as Indonesia. This disease is strongly correlated to tobacco smoking, lifestyle change (unhealthy diet and physical inactivity), and accompanying overweight/obesity. The World Health Organization and many other organizations and associations are urging health decision makers to develop effective and efficient strategies for prevention and control of cardiovascular disease. Strategies targeting high-risk individuals while fostering population-wide preventive activities are obvious and urgently required to contain the epidemic burden of cardiovascular disease. All of these strategies require the need to build a supportive political will to change the necessary health policy. Strengthening policy-relevant research that can support and evaluate the preventive and control programs of cardiovascular disease in the
developing countries may convince the policy makers that investment in public health pays off.

References