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Original Research

Measuring the burden of chronic diseases in Korea in 2007

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SUMMARY

Objectives: This study was performed to measure the burden of disease from premature death and disability for chronic diseases in Korea in 2007.

Study design: Chronic diseases were defined using the WHO definitions. Disability-adjusted life years (DALY) were used to analyse insurance claim data.

Methods: This was a population-based study and included the total population of Korea. DALYs were used to analyse insurance claim data. Years of life lost (YLL) and years lost to disability (YLD) were measured in terms of incidence rate and number of deaths. DALYs were aggregated to YLL and YLD. To ensure code validity, only patients who had visited a tertiary hospital or a clinic three or more times for the same disease were included.

Results: Cerebrovascular disease was the leading contributor to the chronic disease burden, with a value of 907.4, followed by diabetes mellitus (899), ischaemic heart disease (710), cirrhosis of the liver (616.5), chronic obstructive pulmonary disease (512.9), asthma (503.1), hypertensive heart disease (407.5), stomach cancer (356) and peptic ulcer disease (292.5). As these results demonstrate, the highest ranked diseases were cardio-cerebrovascular or related diseases, as well as the fact that hypertension, diabetes mellitus and related complications, which are associated diseases, have become increasingly severe problems. And the rural areas have a higher burden of disease than metropolitan cities. According to difference in social status, Medicaid 2 group has more burden of disease than other groups.

Conclusions: It has been possible to present evidence regarding the burden of diseases and the relatively high risk of cardio-cerebrovascular disease. If the various types of cancer were combined and then the calculating tool applied, the burden would likely be greater than that of cardio-cerebrovascular disease. However, based on DALY, ischaemic heart disease demonstrated a remarkable increase compared to the rate in the previous study based on 2002 data. Underprivileged people in particular have been struggling – with chronic diseases.

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Introduction

The percentage of global mortality due to chronic diseases, such as cerebrovascular disease, cancer, chronic respiratory disease and diabetes mellitus (DM), was 60% (35 million people) in 2005 and almost 80% in low- and middle-income developing countries.¹ Furthermore, some researchers predicted that 4.1 million people would die from chronic diseases by 2015 without relevant preventative measures or treatment.²

Chronic disease management is important for public health officials concerned with maintaining not only a healthy quality of life for the individual, but also stability and equality among society members as a whole. With the booming elderly population, chronic diseases are the primary factor that give rise to medical costs and decreased quality of life. In addition, the disease burden for chronic diseases has sharply increased in South Korea, whose disease distribution has gradually shifted to mirror that of developed countries (WHO, 2008). For these reasons, the Korean Center for Disease Control, the Health Insurance Review and Assessment Service (HIRA) and the National Health Insurance Corporation (NHIC) among others have developed and carried out chronic disease control programs. These programs offer incentives to patients and general practitioners (GP) for regular medical check-ups or for improved health outcomes.

To calculate the risks of chronic diseases and verify the relative severities of several chronic diseases, disability-adjusted life years (DALY) have been actively utilized as an index since the 'Global Burden of Disease (GBD)' project was started in 1990. The World Health Organization (WHO) developed the methodology for the GBD study and suggested some measurements for the burden of diseases, including DALYs, health-adjusted life years (HeaLY), disability free life expectancy (DFLE), health-adjusted life expectancy (HALE) and disability-adjusted life expectancy (DALE).³

DALYs have been applied internationally in several studies as a way to measure the burden of disease. For instance, one study detailed the overall burden of chronic diseases in individual countries, while another study focused on the burden of disease by social status.^{2,4} Using these previous studies, it was relatively straightforward to deduce the relative seriousness of the burden of various diseases and to make comparisons between countries. However, the accuracy of the results of these studies is questionable because data using DALYs are somewhat ambiguous and are estimated with no actual epidemiological data.

In Korea, a number of studies focused on the DALY for a single disease (i.e., mental disease, cancer and hypertension) have been carried out. Several studies have calculated the burden of diseases considering risk factors, such as heavy drinking and obesity.^{5–9} These studies were based on national medical insurance administration data and, therefore, reflect actual health statuses, without relying on estimates. Despite this, the studies were inadequate for determining the relative burden of diseases.

In this study, the burden of chronic diseases was calculated by demographic characteristics and the relative severity of each disease was judged considering not only death by chronic disease, but also the duration of disability for a period of time. In addition, the results as a burden of chronic diseases in 2007 were measured against existing research results and any change in trends were subsequently investigated. The

sum of years of life lost (YLL) and years lost to disability (YLD) is known as the DALY. YLD and YLL are measured in terms of incidence rate and number of deaths.

In Korea, more than 96% of the population is covered by national health insurance, and all health insurance claim data are evaluated by HIRA. This study was based on the national medical insurance administration data and therefore reflected actual health status without estimation as a population-based study.

Methods

Population

This is a population-based study in Korea, including the entire population as the study subjects. Among the total population (49,130,354 persons), 3,535,530 persons were diagnosed with a chronic disease in 2007. In Korea, GPs are known to occasionally offer incomplete diagnoses in order to receive insurance payments through the inspection conducted by HIRA. So, to ensure code validity, only those patients who have visited tertiary hospitals or a clinic three or more times for the same disease were included.

Data calculation methodology

The burden of disease following incidences and deaths due to a specific chronic disease was calculated based on incidence rate, prevalence rate, age of onset, duration and disability severity.¹⁰ Using these data, DALYs could be obtained as the sum of YLL and YLD. This study considered comparability by applying a discount rate according to the time value and age weight, as suggested by the WHO.

Data management

The WHO defines a chronic disease as a disease with a long duration, where impairment is permanent and irreversible, and where special training for rehabilitation is required, in addition to the necessity for long-term treatment or care.¹² Here, a chronic disease has been described as a 'non-communicable disease' which adheres to the WHO GBD project definition. WHO's all disease groups were classified in detail. For example, according to WHO's classification, the cardiovascular diseases included rheumatic heart disease, hypertensive heart disease, ischaemic heart disease, cerebrovascular disease and inflammatory heart disease. The DALY for all cardiovascular diseases were not calculated together but separately for each disease.

Incidence rate

In order to calculate the incidence rate for DALYs, medical services claim data from the NHIC of Korea in 2007 were obtained. This data was classified according to the primary disease diagnosis (ICD-10 code) and the patient identification number.

An exception was made for duplicate cases between 2004 and 2006 according to the primary diagnosis and the identification number of incidence cases. We then calculated the incidence rate as the total number of incidence cases divided

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