Research For Extending The Scope Of Health Technology Assessment (HTA): Focusing On Tobacco Control

Sungkyu Lee[1], Jeonghoon Ahn[1], Jae Kyung Suh[1], Songhee Cho[1], Minjoo Kang[1]

1 National Evidence-based Healthcare Collaborating Agency

☐ Background

The 67th World Health Assembly 2014 has adopted the resolution titled, "Health intervention and technology assessment in support of universal health coverage" emphasizing the health technology assessment was the core element of health finance efficiency. The Health Technology Assessment (HTA) is being expanded beyond the assessment of drugs and medical devices to the public health program or health care system-related policies to improve the people's health through this resolution.

Globally, the number of smoking-related deaths reaches up to 6 million people per year and in Korea, also approximately 58,000 people died from diseases caused by smoking as of 2012. Smoking is a key harmful factor for the non-communicable diseases (NCDs), and developed countries has been putting efforts to reduce the number of death caused by smoking through reinforcement of the tobacco control policy but the Asia-Pacific region including Korea still shows a high rate of smoking.

The Asia Pacific Regional Capacity Building for the Health Technology Assessment (ARCH) was organized in 2013 to raise awareness on the HTA and to cultivate and reinforce systematic and technical capacities. In 2014 as the first project, ARCH had adopted application of health technology assessment to non-smoking areas for tobacco control policy enforcement and for increasing the efficiency of non-smoking assistance program, while it is conducting an international joint research. In Korea, as the interest in quitting smoking is increased, such as smoking cessation program or policy

development efforts are being vitally undertaken. However, development of tools to predict and evaluate the outcomes of related studies or the results of smoking cessation program and tobacco control policies being implemented or to be introduced in the future, are still limited in the country.

☐ Objectives

The purpose of the study was to examine the applicability of such tools in Korea by participating in an international joint research that aims expanding the scope of utilization and application of HTA, to investigate the domestic applicability of these tools, and to enhance the expertise of international researches of the National Evidence-based healthcare Collaborating Agency (NECA) by actively sharing the current conditions of Korea and study results in the process of the international joint research. Also the study aimed to contribute to the advancement of domestic smoking cessation programs and the development of national tobacco control policies by identifying and derivation of the studies lacking in developing assessment tools in Korea.

☐ Methods

I. Participation in ARCH International Joint Research

ARCH had chosen smoking cessation programs and tobacco control policies as the first cases of research for health technology assessment corresponding to the status of each nation at its inception meeting in 2013 and then held two workshops and an annual conference in 2014.

II. Domestic Application of HTA in Tobacco Control Field

Tobacco Return On Investment (ROI) tool has been developed by UK National Institute of Health and Care Excellence (NICE) and Brunel University to support national or local government to easily predict the effectiveness of simultaneous implementation of integrated non-smoking policies and programs. The ROI tool is based on 'Markov model' consisted of smokers, past smokers,

and the health status of death. Depending on whether to participate in a smoking cessation program and whether succeeded in the smoking cessation, data was to be accumulated and collected such as healthcare cost, productivity loss and health-related quality of life for each cycle.

ARCH international joint research had constructed the list of data and information required for developing Asian version of the ROI tool, and in Korea, domestic data source and data were investigated based on it.

Ⅲ. Development of Domestic Research Topic: Association between Quit-smoking and Health-Related Quality of Life

In terms of conducting an economic analysis on the smoking cessation policy or program, it is important to reflect the quantitative and qualitative changes of life obtained from reduction of smoking-induced mortality. In order to reflect the aforementioned, Quality Adjusted Life Year (QALY) was used as the effectiveness of such as smoking cessation programs, but as there were little domestic researches available for Health-Related Quality of Life (HRQoL) that could estimate the QALY associated with smoking, previous research commonly used data from overseas. As for the HRQoL, it is reported that HRQoL would show differences due to cultural and social factors, so that the domestic database construction is essential in this regard. Thus, this study had derived the effects of smoking cessation on the HRQoL as a research topic and conducted the research.

Using the 5th Korea National Health and Nutrition Examination Survey (KNHANES, 2010-2012), we examined the impact of quit smoking on the HRQoL. In the analysis, adult population at 19 years of age or older was included. Depending on the smoking status, they were categorized as non-smoker, current smoker, and ex-smoker. The dependent variable was EQ-5D value and it was adjusted for demographic characteristics such as gender, age, educational level, occupation, marital status and income level and health related characteristics such as presence/absence of chronic diseases, recognition level of daily stress, and limitation on activities. A

regression analysis with consideration of the complex sample design of the KNAHES was performed.

Also we co-hosted a joint seminar with the Korean Society for Research on Nicotine and Tobacco to share the outcomes from this study and to hear experts' opinions in the related fields. About 20 experts in tobacco control had attended to this seminar which was held at the auditorium of Inje University, Seoul Paik Hospital on November 17, 2014, At the seminar the attending participants were introduced about non-smoking ROI tool of UK and also discussed on the results of HRQoL.

☐ Results

I. Participation in ARCH International Joint Research

The first workshop was held in Manila, the Philippines from April 10 to 11 in 2014, where there was introduction of the concept and methodologies of health technology assessment. The regulatory circumstances of each country related to tobacco control had been shared, and the NECA also introduced smoking cessation programs and tobacco control policies in Korea.

The second workshop was held for two days from August 28 to 28 at Bali, Indonesia, and at the workshop, a training session was provided on ROI tool, which can be used a policy assessment tool as well. In connection to tobacco related priority setting and policy making, the role of South East Asia Tobacco Control Alliance (SEATCA) and the Framework Convention on Tobacco Control (FCTC) of WHO were introduced, leading to reviewing on the international trend related to tobacco control.

On November 21, at the first ARCH Conference held in Singapore, utilization of ROI as a tool for tobacco control policy assessment was discussed based on aforementioned past 2 workshops, and each country had shared the research outcomes undertaken in their locality. The NECA has presented the outcomes of 'Successful quit-smoking and health-related quality of life' in use of the data from the KNHANES which was spotlighted

as the very first research in Asia on the effects of smoking on the health-related quality of life.

Ⅱ. Domestic Application of HTA in Tobacco Control Field

The UK tobacco ROI tool included 23 smoking cessation programs in total. As participation rate or smoking cessation success rate changed, the tool enabled to predict the changes of outcomes. For the outcome index, net cost saving effect, cost-benefit ratio and cost per QALY gained were included, and long-term/short-term effectiveness of non-smoking policies and programs were identifiable.

There were a variety of cost analysis based on the data of the National Health Insurance Service (NHIS) such as annual cost of smoking related diseases, or smoking-related unit cost applicable to the direct cost of health system, nevertheless the cost data of national or local level smoking cessation program was insufficient. In addition, there was available data for disease-adjusted life years (DALY) of smoker or patients with smoking-related diseases, whereas the data for HRQoL was absent. The data of relative risk and survival rate for diseases depending on smoking status, which are essential for the comparative study of effectiveness, were studied across various disease groups including cancer, cardiovascular diseases and pulmonary diseases. However, systematic data for participation rate in smoking cessation program or success rate of smoking cessation through such programs were absent in Korea.

From the results of identification of the domestic data according to the minimally required data lists for the ROI tool application, Korea had advantages that it can utilize the national claims data of the NHIS or the Insurance Review & Assessment (HIRA). However, as up-to-date data including prevalence and/or morbidity of smoking-related disease incidence and relative risk of disease was limited, it became the restriction for utilizing tobacco control ROI tool. Furthermore, due to the absences of data on the rate of smokers participating in smoking cessation programs provided at

national, local, or private sector's level, the success ratio of smoking cessation, and data on disease-induced HRQoL, it was difficult to apply such domestic data to the ROI tool.

Ⅲ. Development of Domestic Research Topic: Association between Quit-smoking and Health-Related Quality of Life

A total of 17,303 adults were included in the analysis and it was identified that non-smokers, ex-smokers, and current smokers were accounted for 55.7%, 17.3%, and 27.0% respectively. The mean age of current smokers was 41.7 years (standard error (SE) 0.317), showing a lower tendency to the ages of non-smokers (mean 45.6 years, SE 0.273) and ex-smokers (mean 51.3 years, SE of 0.393). There was a difference in EQ-5D values, depending on the state of current smokers smoking an average of 0.959 (SE 0.002), ex-smoker as an average of 0.951 (SE 0.002), and non-smokers as an average of 0.941 (SE 0.001). After adjusting with socio-demographic variables and health-related variables, EQ-5D of ex-smokers was higher than current smokers by 0.010 (95% confidence interval from 0.005 to 0.014), and EQ-5D of non-smokers was also higher than current smokers by 0.008 (95% CI 0.004 to 0.013).

☐ Conclusions

As the importance of HTA has been increasing, the efforts to expand its scope for utilization is also growing. This study may have had its significance in terms that it had expanded the HTA to tobacco control area in the public health field. The domestic applicability of the UK's ROI tool seemed very slight as there was insufficient domestic data to be used for assessing tobacco control policies or smoking cessation programs. In this regard, this study had investigated the association between quit-smoking and the HRQoL using the KNHANES. Since this study was the first study carried out for the expansion of application targets for HTA, a subsequent study should be conducted in connection to this study. The outcomes of this study

is expected to contribute not only to advancement of the national policies for domestic smoking cessation and preventive policies for smoking but also to the advancement of HTA in Korea.

Key Words

: HTA, international joint research, tobacco, smoking, tobacco control policy