VALUE IN HEALTH REGIONAL ISSUES 3C (2014) 108–116

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/vhri

The Health Technology Assessment Environment in Mainland China, Japan, South Korea, and Taiwan—Implications for the Evaluation of Diabetes Mellitus Therapies

Tessa Kennedy-Martin, MSc[1], Beth D. Mitchell, RN, BSN[2,], Kristina S. Boye, MS, MPH, PhD[2], Wen Chen, PhD[3], Bradley H. Curtis, DDS, MPH, PhD, FICD[2], Jennifer A. Flynn, MSPH[4], Shunya Ikeda, MD, DMSc[5], Li Liu, PhD[6], Yen Huei Tarn, PhD[7], Bong-Min Yang, PhD[8], Emmanuel Papadimitropoulos, PhD[2]*

[1]*Kennedy Martin Health Outcomes Ltd, Brighton, United Kingdom;* [2]*Eli Lilly and Company, Indianapolis, IN, USA;* [3]*School of Public Health, Fudan University, Shanghai, P.R. China;* [4]*Eli Lilly Japan K.K., Kobe, Japan;* [5]*School of Pharmacy, International University of Health and Welfare, Ohtawara-city, Tochigi, Japan;* [6]*Lilly Suzhou Pharmaceutical Co., Ltd, P.R. China;* [7]*School of Pharmacy, National Defense Medical Center, Taipei, Taiwan;* [8]*Seoul National University, Seoul, South Korea*

ABSTRACT

Background: Diabetes mellitus (DM) is associated with a significant global economic and humanistic burden. The condition presents a real challenge in Asia, which accounts for more than 60% of individuals with DM globally. Health technology assessment (HTA) is a field of scientific research used to inform policy and clinical decision making relating to the introduction and diffusion of health technologies. **Objectives:** This article, examines the present use and predicted evolution of HTA with respect to pricing and reimbursement of drugs in mainland China, Japan, South Korea, and Taiwan. It makes specific reference to important assessment considerations for DM therapies, which should assist key stakeholders in choosing which data to capture, and what approaches to use, to help quantify the value of treatment. **Methods:** The findings are informed by two Advisory Board discussions, a literature review, and the authors' personal experience. **Results:** HTA already has a key role in South Korea and Taiwan, with current systems undergoing important changes. In contrast, in mainland China and Japan, HTA is not yet formally utilized, although this appears likely to change. Several elements are important for HTA to be meaningful and impactful for DM therapies, including a clear, transparent analytical framework for HTA that includes all relevant costs and outcomes; availability of local DM epidemiologic, economic, and quality-of-life data; acceptance of modeling as a core methodology; availability of real-life patient data; and recognition of specific evidence requirements associated with biosimilars. HTA has the potential to assist payors in making informed decisions about the coverage of DM medications.

Keywords: Asia, diabetes mellitus, health technology assessment, pricing, reimbursement.

Introduction

Asia accounts for more than 60% of the global population of people with diabetes mellitus (DM) [1]. In the Western Pacific region, which includes mainland China, Japan, South Korea, and Taiwan, there are 131.9 million people (8.5% of the adult population) who have DM, and this region also has the highest number of deaths attributable to DM: 15% of all deaths in 2011 were related to DM [2]. The prevalence of type 2 DM (T2DM) is increasing; this is being driven by a number of factors, including economic development, dietary changes, and increasingly sedentary lifestyles [3,4]. Compared with people in other regions, people in Asia tend to develop diabetes with a lesser degree of obesity and at younger ages, suffer longer from its complications, and die earlier [5]. There is great diversity in social and economic development, population size, health care system, language, religion, and culture across Asia [6]. In this article, we focus specifically on mainland China, Japan, South Korea, and Taiwan, which, despite their differences, all commonly face the growing challenge of DM.

Despite the existing evidence on the importance of intensive glycemic management [7–9], DM control is suboptimal. Studies in mainland China, South Korea, and Taiwan report that the proportion of patients with DM achieving a glycated hemoglobin level of less than 7.0% ranges from 32% to 44%; in Japan, only 34% of the patients with DM have been reported to have a glycated hemoglobin level of less than 6.5% [10–13].

DM imposes substantial demands on health care resources: it is estimated that the total global health care expenditure on DM in 2010 was at least US $376 billion, and this figure is expected to increase to US $490 billion by 2030 [4]. The International Diabetes Federation has

Conflict of interest: B.D. Mitchell, K.S. Boye, B.H. Curtis, J.A. Flynn, L. Liu, and E. Papadimitropoulos are employees of Eli Lilly. B.H. Curtis, K.S. Boye, E. Papadimitropoulous, J.A. Flynn and B.D. Mitchell are shareholders.

* *Address correspondence to:* Beth D. Mitchell, Eli Lilly and Company, Indianapolis, IN 46285.

E-mail: mitchell_beth_d@lilly.com.

2212-1099$36.00 – see front matter Copyright © 2014, International Society for Pharmacoeconomics and Outcomes Research (ISPOR). Published by Elsevier Inc.

http://dx.doi.org/10.1016/j.vhri.2014.03.001

estimated country-by-country expenditures on adults with DM aged 20 to 79 years, expressed in US $ and in international dollars—a US dollar that is adjusted to account for differences in purchasing power [4]. National-level cost data for mainland China, Japan, and South Korea are presented in Table 1. A separate study reported that the total cost of DM to society in Taiwan is approximately US $2.96 billion, equivalent to approximately 0.8% of the gross domestic product [14].

The economic burden of DM is driven primarily by the cost of complications [15]. In a Japanese study, the medical costs for patients with DM with nephropathy were 2.1-fold higher than for those without nephropathy, while evidence of retinopathy and neuropathy was associated with 2.6-fold and 3.3-fold higher costs, respectively [16]. A Korean study reported that annual direct medical costs for a patient with only microvascular, only macrovascular, or both macrovascular and microvascular complications were 1.5, 2.7, and 2.0 times higher than the medical costs for patients without these complications [17].

Health technology assessment (HTA), as defined by the International Network of Agencies for Health Technology Assessment, is a multidisciplinary field of policy analysis, studying the medical, economic, social, and ethical implications of development, diffusion, and use of health technology [18]. It is accepted that through benefit-harm assessment and economic evaluation, a major use of HTA is to inform pricing, access, and reimbursement decisions. The main focus of our article, therefore, is to report whether, and if so how, HTA is presently used as part of the decision-making process to inform coverage and funding decisions of DM medications in mainland China, Japan, South Korea, and Taiwan, and to discuss how this could evolve in the future. The general themes included in this article were informed by discussions at Advisory Boards held in Hong Kong (October 2011) and Tokyo (October 2011) and were further refined through review of the published literature and the personal experience of the authors. We provide a brief overview of evidence-based assessment systems in mainland China, Japan, South Korea, and Taiwan, and discuss the implications of these systems on the pricing and reimbursement of DM medications. We anticipate that this overview will help to ensure that relevant outcomes and perspectives are included in future HTA analyses of DM treatment strategies and medications and that it will also assist manufacturers in choosing which data to capture to help quantify the value of their therapies for future evidence-based assessment and HTA analyses.

Overview of the Role of HTA in Pricing and Reimbursement of Drugs

Table 2 summarizes the current process for pricing and reimbursement for drugs, the role that HTA has in the current health care systems, and how this is expected to change in the future in mainland China, Japan, South Korea, and Taiwan. HTA already has a key role in the assessment of medications in South Korea and Taiwan. In contrast, HTA is not yet formally utilized in reimbursement and price decision making in mainland China or Japan, although this may change in the future.

Table 1 – Cost of DM in mainland China, Japan, and South Korea [4].

Region	National-level cost estimate (×000)	
	US $	ID
Mainland China	4,968,697	19,322,712
Japan	22,150,915	18,846,385
South Korea	4,130,467	5,361,541

DM, diabetes mellitus; ID, international dollars.

In South Korea, economic evidence is required for a drug to be included in the Positive List Scheme (PLS). There is no benchmark for the incremental cost-effectiveness ratio because the Health Insurance Review Agency (HIRA) makes flexible judgments alongside other criteria such as disease severity and innovation. Nevertheless, a benchmark of around one times the gross domestic product per capita (US $26k, 2007) has evolved as a general reference value [19]. An assessment of 47 evaluations that were approved by HIRA after the introduction of the PLS found that, on average, 14 of the 20 items on the HIRA checklist for quality assessment of pharmacoeconomic evaluations submitted for coverage decisions were fulfilled. Where cost-utility analysis was undertaken, the incremental cost-effectiveness ratios from a societal perspective ranged from dominant to US $28k per quality-adjusted life-year for "recommended" submissions (n = 6), US $8k to US $20k per quality-adjusted life-year for "recommended with restricted use" submissions (n = 4), and US $13k to US $59k per quality-adjusted life-year for "not recommended" submissions (n = 3) [19]. Bae and Lee [20] reported that by the time of their published analysis in 2009, only 10 of these 47 drugs were actually priced and listed by the National Health Insurance Corporation [20]. The separation of the reimbursement recommendation by HIRA and the price/volume negotiation between the technology manufacturer and the National Health Insurance Corporation has led to claims that there is administrative duplication. In addition, the "listing lag" has generated skepticism from the industry [21].

Significant changes are currently ongoing in Taiwan since the second generation of the National Health Insurance system was implemented in 2013. The drug manufacturer submits the dossier according to the structure specified by the National Health Insurance Administration (NHIA) (see Table 2). The NHIA sends the dossier to the National Institute of HTA (previously the HTA group within the Center for Drug Evaluation), which conducts an independent assessment using comparative effectiveness and economic evidence, as well as undertaking its own budget impact analysis. The assessment report is then sent to the NHIA, where an expert consultation group conducts the initial appraisal. The new system introduced in 2013 involves a Pharmaceutical Benefit and Price Schedule Stakeholders' meeting between the NHIA and public and medical professional representatives, who will make the final value judgment on the recommendations put forward by the expert consultation group. The judgment arising from the Stakeholders' meeting is sent to the NHIA for a final decision. The price is initially recommended by the expert consultation group, and further approval is given at the Stakeholders' meeting before the recommendation is sent to the NHIA. Similar to the previous system, the stronger the evidence for the drug, the higher the support for inclusion in the PLS. In addition, there are incentives offered for the use of local economic data, whereby a price premium of up to 10% is available if data from a local pharmacoeconomic study are submitted in the dossier.

In both mainland China and Japan, there are indications that HTA will have a future role in access to medicines (Table 2). The structure that this will take within the overall process of pricing, reimbursement, and access environment, however, is still under discussion.

The Assessment of DM Medications within an HTA System

A set of 15 best practice principles has been proposed that can be used to assess existing HTA programs. These are organized into four categories: structure of HTA programs, methods of HTA, processes for conducting an HTA, and use of HTAs in decision making [22]. It is not our aim to apply these principles to the geographies of interest, but rather to focus on some key features of an assessment framework that would have specific relevance to the appraisal of DM therapies. The list is not meant to be exhaustive and is intended to