



Original Research

The impact of medication adherence on health outcomes for chronic metabolic diseases: A retrospective cohort study

Euna Han, Ph.D.^a, Dong-Churl Suh, Ph.D.^b, Seung-Mi Lee, Ph.D.^b,
Sunmee Jang, Ph.D.^{c,*}

^aCollege of Pharmacy, Yonsei Institute of Pharmaceutical Sciences, Yonsei University, Incheon, South Korea

^bCollege of Pharmacy, Chung-Ang University, Seoul, South Korea

^cCollege of Pharmacy, Gachon University, Incheon, South Korea

Abstract

Background: Hypertension, diabetes, and hyperlipidemia have a large influence on health outcomes due to their chronic nature and serious complications. Medication is a key factor in preventing disease advancement, and it is important to assess whether good medication adherence has any potential long-term impact on health outcomes and provides an international validation on the relationship.

Objectives: To evaluate the impact of good medication adherence on health outcomes of complications and hospitalizations for hypertension, hyperlipidemia, and diabetes.

Methods: Patients who had had outpatient pharmacy claims for drugs for hypertension, diabetes, or hyperlipidemia were separately identified from the Korean National Health Insurance Claims Database in year 2009. A 10% random sample was respectively drawn from the three disease groups, and all claims from years 2008–2011 were extracted for the sampled subjects. Medication adherence was measured by the medication possession ratio (MPR) during the 12-month after the index date, the initial date from when medication was counted, with poor adherence as <80% of MPR. Health outcomes were measured both at 2 and 3 years after the index date as any occurrence of disease-related complications, disease-specific hospitalizations, and all-cause hospitalizations.

Results: Poor medication adherence was associated with a higher occurrence of disease-specific hospitalizations for hypertension patients (+10.9%, only at 2 years). The likelihood of all-cause hospitalization was higher among patients who had poor medication adherence in hypertension (+32% and +29% at 2 and 3 years), hyperlipidemia (+16% and +14% at 2 and 3 years), and diabetes (+32% and +29% at 2 and 3 years). Poor medication adherence also increased the likelihood of complications for hypertension (+14% and +7% at 2 and 3 years) and hyperlipidemia patients (+8.1% at 2 years).

Conclusions: Targeting good medication adherence could be a valuable policy strategy to effectively manage chronic diseases to improve health outcomes.

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* Corresponding author. College of Pharmacy, Gachon University, 191, Hambakmoero, Yeonsu-gu, Incheon 406–799, South Korea. Tel.: +82 32 820 4827; fax: +82 32 820 4821.

E-mail address: smjang@gachon.ac.kr (S. Jang).

Keywords: Medication adherence; Health outcomes; Hypertension; Diabetes; Hyperlipidemia; National health insurance claims data; South Korea

Introduction

The prevalence of chronic diseases has gradually increased in South Korea for hypertension (from 24.6% in 2005 to 26.9% in 2010), diabetes (from 8.6% in 2001 to 9.7% in 2010), and hyperlipidemia (from 8.0% in 2005 to 13.5% in 2010).¹ These diseases are likely to become even more prevalent as the Korean population ages.² The impact of those diseases on health outcomes and resource utilization can be large due to their lingering nature and their potential serious complications. Although behavioral factors such as food intake patterns, smoking, or physical activities, are known to influence prognosis of those diseases, medication is a key factor in preventing disease advancement.³

Several previous studies reported the importance of persistent medication for effectively treating symptoms and preventing complications from chronic diseases including hypertension, diabetes, and hyperlipidemia in terms of health care utilization such as hospitalization,^{4–8} health care costs,^{5,6,9} and direct clinical management of health outcomes and mortality.^{10,11} Lindgren et al (2010) reported that 80% or higher medication possession ratio of lipid-lowering medications was associated with lower risk of complications (HR = 0.75, 95% CI [0.56, 0.98]) and improved long-term projected survival (10.83 vs. 10.81) and quality-adjusted survival years (8.13 vs. 8.11) compared to <50% possession ratio among hypertensive patients.⁶ Sokol et al (2005) also showed that >80% medication adherence was associated with lower disease-related medical costs (diabetes and hypercholesterolemia patients only) and a lower likelihood of hospitalization for patients with hypertension, diabetes, hypercholesterolemia, or congestive heart failure. Furthermore, the risk of all-cause hospitalizations and the total health care costs also decreased as medication adherence increased, particularly for patients with diabetes and hypertension.⁵ Another study by Wu et al (2010) showed that poor medication adherence (<80% in medication possession ratio, MPR) was associated with poor blood pressure control (OR = 1.20, 95% CI [1.13–1.29]), CVD-related hospitalization (OR = 1.43, 95% CI [1.14–1.81]) and all-cause hospitalization (OR = 1.47, 95% CI [1.21–1.78]).¹² Despite the consensus in the

literature regarding the importance of persistent medication for treatment outcomes for chronic diseases, sustaining medication to the ideal level for those diseases has been a challenge.¹³ Medication adherence to lipid-lowering agents was reported to be less than 100% in a year and to further fall to 33% over time.^{7,14–23}

The current study builds on previous literature and assesses the impact of good medication adherence for chronic diseases including hypertension, hyperlipidemia, and diabetes on health outcomes, using nationally representative administrative claims data for 4 years (2008–2011) from the National Health Insurance in Korea. Extracting medication adherence and health outcomes from the National Health Insurance database improves the external validity of the findings given that it is nationally representative data for health services utilization and literally covers all Koreans as beneficiaries. The study also explored whether the health outcomes of good medication adherence were sustained over time. This helps to assess whether good medication adherence has any potential long-term impact on health outcomes and provides an international validation on the relationship of medication adherence on health outcomes and resource utilization, which are well established in the United States.

Methods

Data

The study used the Korean National Health Insurance Claims Database, which has accumulated all electronic filings of outpatient, inpatient, emergency and pharmacy claims reimbursed in the National Health Insurance system across the entire nation. The Korean healthcare system, based on social insurance called the National Health Insurance, covers approximately 95% of Koreans who can pay the premium and the rest 5% as beneficiaries of Medicaid for the impoverished. The current study pulled the claims data for 4 years between years 2008 and 2011.

In the current study, three groups of patients with hypertension, hyperlipidemia, and diabetes were respectively identified based on International Classification of Disease 10 codes (ICD-10 codes)

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