

Generalizability and effect size of the impact of anti-hypertensive medication adherence on long-term cardio-cerebrovascular mortality

To the Editor,

The authors read with pleasure the review paper by Kim and coworkers, titled "Clinical impact of medication adherence on 10-year cardio-cerebrovascular mortality in newly diagnosed hypertensive patients," that sought to assess the impact of medication adherence on cardio-cerebrovascular mortality in patients with newly diagnosed hypertension. The authors concluded that medication adherence significantly improves the 10-year mortality of newly diagnosed hypertensive patients.¹ In particular, a higher medication adherence rate was associated with better outcomes in patients suffering from hypertension-related complications.¹ However, the following limitations should be considered when interpreting the results of this study:

The researchers identified patients with hypertension based on the ICD-10 code documented in patient medical records. For patients without a medical record, the authors used the date of starting new antihypertensive drugs as an indicator of a diagnosis of hypertension. However, many antihypertensive agents, including diuretics, beta-blockers, and calcium channel blockers, can be used for conditions other than hypertension. For instance, beta-blockers are commonly prescribed for anxiety and migraine prophylaxis and diuretics are commonly prescribed for kidney failure and heart failure.²⁻⁵ Therefore, normotensive patients may have been defined as hypertensive in the study, so the apparent magnitude of the effects of hypertension on long-term cardio-cerebrovascular mortality may be diminished. Likewise, normotensive patients taking the hypertensive medications for non-hypertension-related reasons may experience reduced cardio-cerebrovascular mortality due to the preventive or protective effects of their medications rather than due to the treatment of any underlying cardio-cerebrovascular pathology, thus overestimating the beneficial effects of medication adherence by combining the protective effects in normotensive patients with the therapeutic effects in hypertensive patients.

The Republic of Korea has a largely homogenous population.⁶ Race and ethnicity influence cardiovascular factors, with long-term effects on cardio-cerebrovascular mortality, especially in racial/ethnic populations, such as African-Americans, that are predisposed to

develop hypertension early in their lives.⁷⁻¹⁰ Additionally, poor living conditions and discrimination against minority racial/ethnic groups can contribute to development of metabolic syndrome, subsequently leading to poor cardiovascular outcomes.¹¹ Thus, the results presented by Kim and coworkers are less generalizable for countries, such as the United States and Canada, where populations are more heterogeneous and are subject to a variety of factors that may independently contribute to the development of hypertension and cardio-cerebrovascular mortality.

Furthermore, the data used for this study was provided by Korean National Health Insurance Services (NHIS), which reports data on patients that have health/medical insurance, which accounts for 97% of the Korean population.^{12,13} The Korean government pays for medical expenses for the remaining 3% of the population.¹³ In countries with differing healthcare systems, such as the United States, it is difficult to obtain prescription medications without medical insurance and the adherence rate of patients without access to medications cannot be determined.¹⁴ Therefore, the adherence rate would not be a reliable factor for the measurement of long-term mortality rates in countries with large populations of uninsured patients, as the overriding factor would be the ability access adequate healthcare in the first place.

In essence, the study by Kim and coworkers advances the understanding of the impact of nonadherence to antihypertensive medications on cardio-cerebrovascular mortality, but further studies are required to support and generalize the findings presented in the review paper.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests or conflicts of interests.

AUTHOR CONTRIBUTIONS

Mr. Modak developed the concept of the letter. Ms. Shihora performed the literature review and wrote the letter with the support of Mr. Modak and Ms. Bono. All authors contributed to the revision and editing of the letter.

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