

Identifying the gender characteristics of patients with resistant hypertension

October 30 2023



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Professor Eung Ju Kim of the Cardiovascular Center, Korea University's Guro Hospital, and his research team identified the gender difference of prescription patterns and clinical prognosis in patients with resistant hypertension for the first time.

Using the Observational Medical Outcomes Partnership Common Data Model (OMOP-CDM), the research team analyzed population characteristics, prescription patterns, and clinical prognosis by gender on 4,926 patients with resistant hypertension who visited the [hospital](#) between January 2017 and December 2018.

As a result, the average age of male patients with resistant hypertension was 61.7 years, which is 8.2 years younger than the average age of 69.9 for [female patients](#). However, the ratio of male patients in the high-risk group of cardiovascular risk was 42.5%, compared to 35% of female patients. In addition, 3 years of follow-up showed that the incidence of myocardial infarction and [renal dialysis](#) was higher in male patients, and the incidence of stroke and dementia was higher in female patients.

	Male	Female	Total Patient No.
Renal Dialysis	147(5.6)	93(4.0)	240(4.9)
Myocardial Infarction	88(3.4)	49(2.1)	137(2.8)
Stroke	58(2.2)	74(3.2)	132(2.7)
Dementia	31(1.2)	68(3.0)	99(2.0)

▲ Table1. Number of patients with diseases after 3 years of follow-up (unit: persons %)

Disease Classification	Risk Rate
Death (any cause)	2.52 (1.12-5.63)
Myocardial Infarction	1.87 (1.14-3.09)
Hospitalization due to Heart Failure	1.44 (1.08-1.92)
Renal Dialysis	1.27 (0.88-1.84)
Stroke	0.83 (0.47-1.48)
Dementia	0.69 (0.33-1.44)

▲ Table2. Risk rates of diseases in male patients with resistant hypertension corrected for statistical factors

Credit: Korea University College of Medicine

Statistically corrected relative risks showed that [male patients](#) with resistant hypertension had 2.52 times higher mortality rate, 1.87 times higher myocardial infarction rate, and 1.44 times higher hospitalization rate for heart failure than female patients.

Resistant hypertension is a case of a patient who takes 4 or more antihypertensive drugs or a condition in which [blood pressure](#) cannot be controlled even after taking 3 or more [antihypertensive drugs](#). It is

estimated to be 5 to 10% of all hypertensive patients.

It is mainly associated with myocardial hypertrophy due to old age, obesity, excessive salt intake, [chronic kidney disease](#), diabetes, and hypertension complications. Unlike common hypertension which can be controlled with 2 drugs, resistant hypertension is known to have a much higher risk of cardiovascular diseases and complications.

The corresponding author of this research paper, Professor Eung Ju Kim of the Cardiovascular Center, Korea University's Guro Hospital, said "the KU Medicine Anam, Guro, and Ansan Hospital OMOP-CDM database used in this research is huge data for research consists of standard terms. It contains about 5.8 million patient data from January 2002 to June 2022."

He added, "Precise and detailed analysis in the results of this study was possible due to the refined and standardized OMOP-CDM database. We will continue analyzing cardiovascular diseases from various perspectives in order to identify characteristics that have not been identified before. Based on this, we will create a foundation for realizing precision medicine customized for each patient."

The lead author Professor Hyung Joon Joo of Division of Cardiology, Department of Internal Medicine, Korea University's Anam Hospital said, "This research is significant as it is the first study to compare the different characteristics and occurrences of cardiovascular events among domestic patients with resistant hypertension."

"As male and female patients have different lifestyles and the frequency of side effects on antihypertensive medications; their drug prescription patterns is also different. We assume that such differences affect the differences in the incidence of complications and cardiovascular events due to [hypertension](#). Based on the research results, we will be able to

apply different treatments per gender, as well as early screening and prevention of future complications and cardiovascular diseases will be available."

The research results were published in the *Journal of Korean Medical Science*.

More information: Hyung Joon Joo et al, Gender Difference of Blood Pressure Control Rate and Clinical Prognosis in Patients With Resistant Hypertension: Real-World Observation Study, *Journal of Korean Medical Science* (2023). [DOI: 10.3346/jkms.2023.38.e124](https://doi.org/10.3346/jkms.2023.38.e124)

Provided by Korea University College of Medicine

Citation: Identifying the gender characteristics of patients with resistant hypertension (2023, October 30) retrieved 13 May 2024 from <https://medicalxpress.com/news/2023-10-gender-characteristics-patients-resistant-hypertension.html>

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