

Editorial



Clinical Characteristics of Women With Chest Pain: Men From Mars, Women From Venus

Wang-Soo Lee , MD, PhD

Division of Cardiology, Department of Internal Medicine, Chung-Ang University Hospital, Chung-Ang University College of Medicine, Seoul, Korea



► See the article “Clinical Factors Associated With Three-Year Cardiovascular Outcomes in Women Who Underwent Invasive Coronary Angiography: Data From the KoRean wOmen’S chest pain rEgistry (KoROSE)” in volume 55, e79.

Received: May 13, 2025
Revised: May 30, 2025
Accepted: Jun 4, 2025
Published online: Jun 23, 2025

Correspondence to

Wang-Soo Lee, MD, PhD

Division of Cardiology, Department of Internal Medicine, Chung-Ang University Hospital, Chung-Ang University College of Medicine, 102, Heukseok-ro, Dongjak-gu, Seoul 06973, Korea.

Email: wslee1227@cau.ac.kr

Copyright © 2025. The Korean Society of Cardiology

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORCID iDs

Wang-Soo Lee 
<https://orcid.org/0000-0002-8264-0866>

Funding

This work was supported by grants from the Basic Science Research Program through the National Research Foundation of Korea (2023R1A2C1008160).

Conflict of Interest

The author has no financial conflicts of interest.

One of the best-selling books is titled “Men Are From Mars, Women Are From Venus: A Practical Guide for Improving Communication and Getting What You Want in Your Relationships.”¹⁾ This phrase has since become a common idiom, referring to fundamental differences in thinking and communication styles between men and women. As is widely recognized, humanity consists of 2 sexes—male and female—with distinct biological and behavioral differences.

The term of ‘sex difference’ refers to the biological distinctions between men and women. Humans possess 46 chromosomes, including 2 sex chromosomes: men have 1 X and 1 Y chromosome, while women have 2 X chromosomes. Although men and women are genetically very similar—with approximately 98–99% similarity—the small differences in sex chromosomes and hormonal regulation can have a profound impact on disease susceptibility, symptom presentation, and treatment response. These distinctions underscore the importance of studying sex-specific biological mechanisms in medicine.²⁾³⁾ While genetic similarity alone cannot fully account for phenotypic or clinical differences, it emphasizes that even small genetic variations may lead to notable disparities. Thus, if men and women show meaningful differences in diagnosis, treatment, or prevention of disease, these should be studied systematically under the lens of sex difference medicine.

A concept often confused with sex difference is gender difference. The term ‘gender’ was first used in the 1950s by psychologist John Money, who claimed that gender identity could be shaped by upbringing, education, and socialization.⁴⁾ Although his findings were later discredited, the idea of gender gained widespread popularity without proper understanding in media and academic discourse. Over time, gender ideology has permeated not only social and cultural discussions but also medicine—leading to the emergence of gender medicine. However, because gender is a sociocultural construct that lacks consistent biological grounding, it remains debatable whether it belongs in scientific medicine. Most medical differences are based on biological sex (XX or XY chromosomes), not on psychological or self-identified gender. Therefore, the term sex difference medicine is more accurate and appropriate than gender medicine when referring to biological disparities.

Data Sharing Statement

The data generated in this study is available from the corresponding author upon reasonable request.

The contents of the report are the author's own views and do not necessarily reflect the views of the *Korean Circulation Journal*.

In recent years, sex differences have been investigated in various medical fields, and equally important findings have been published in atherosclerotic cardiovascular disease.⁵⁾ A previous study conducted using coronary intravascular ultrasound demonstrated sex-specific differences in the morphology, amount, and composition of atherosclerotic plaques.⁶⁾ Moreover, sex differences in fractional flow reserve values have been observed not only among patients with atherosclerosis, but also among patients without atherosclerosis, highlighting the effect of biological sex on the development and progression of atherosclerosis.⁷⁾

The study by Kim et al.,⁸⁾ which utilized data from the KoRean wOmen'S chest pain rEgistry (KoROSE), was motivated by the historical underrepresentation of women in cardiovascular research. The authors investigated predictors of major adverse cardiovascular events (MACE) in 741 Korean women who underwent invasive coronary angiography (ICA) and completed 3-year follow-up. MACE occurred in 5.7% of the participants within 3 years. Multivariate analysis revealed that independent predictors of MACE included heart rate ≥ 100 bpm (hazard ratio [HR], 4.04, $p=0.025$), multivessel disease (HR, 2.08, $p=0.038$), left ventricular hypertrophy (left ventricular mass index >95 g/m²; HR, 2.79, $p=0.004$), and diuretic use (HR, 2.51, $p=0.029$). These findings are clinically meaningful, as each of these risk factors is potentially modifiable. Other studies based on KoROSE data have also reported sex differences, and these results are very noteworthy. In a cohort of 1,549 patients, men reported more classical squeezing-type pain on the left side of the chest, while women complained of non-specific symptoms, such as dull pain localized in the epigastric and retrosternal areas.⁹⁾ Additionally, ICA findings showed that men had a higher prevalence of obstructive coronary artery disease and were more likely to have high-risk angiographic features, such as three-vessel disease or left main involvement.¹⁰⁾ The above findings revealing these differences between men and women are another good example of the need for sex-specific strategies in diagnostic and treatment workflows.

Since the present study, conducted by Kim et al.,⁸⁾ is an observational design of the KoROSE data, it is difficult to confirm the causal relationship between the four independent risk factors causing MACE. Furthermore, the absence of data on lifestyle behaviors and socioeconomic status can limit the ability to control for confounding variables. Lastly, since the cohort comprised exclusively Korean women, the results may not be directly generalizable to other ethnicities or healthcare systems. Nevertheless, the study offers valuable and actionable insights for clinicians treating female patients in Korea because it can secure data on Korean women. Therefore, these findings from the KoROSE data have shed light on key clinical differences between men and women with chest pain in Korea.

In conclusion, women presenting with chest pain who undergo ICA and have risk factors such as increased heart rate, multivessel disease, left ventricular hypertrophy, and diuretic use are at higher risk for MACE within three years. Therefore, such patients require closer monitoring, aggressive pharmacologic therapy or earlier consideration of interventional treatment, along with personalized management strategies. Taken together the results of KoROSE data published so far,⁸⁾⁻¹⁰⁾ physicians and health administrators should acknowledge the need for special education and awareness campaigns designed to incorporate sex-specific characteristics for both women and men. It will ensure each group benefits from tailored approaches grounded in their unique clinical presentations and risk profiles. Furthermore, in order to realize this objective, it is important to develop sex-specific guidelines for diagnosis, treatment, and prevention through collaborative and sustaining efforts between physicians,

researchers, and public health authorities. Finally, government support and national research initiatives are also crucial, which will serve as the foundation for establishing a 'national cardiovascular precision healthcare system' that recognizes and integrates sex-specific characteristics in the future.

REFERENCES

1. John G. *Men Are From Mars, Women Are From Venus: A Practical Guide for Improving Communication and Getting What You Want in Your Relationships*. New York (NY); HarperCollins; 1992.
2. Richardson SS. Sexes, species, and genomes: why males and females are not like humans and chimpanzees. *Biol Philos* 2010;25:823-41. [PUBMED](#) | [CROSSREF](#)
3. Mouse Genome Sequencing Consortium, Waterston RH, Lindblad-Toh K, et al. Initial sequencing and comparative analysis of the mouse genome. *Nature* 2002;420:520-62. [PUBMED](#) | [CROSSREF](#)
4. Bullough VL. The contributions of John Money: a personal view. *J Sex Res* 2003;40:230-6. [PUBMED](#) | [CROSSREF](#)
5. Ann SH, De Jin C, Singh GB, et al. Gender differences in plaque characteristics of culprit lesions in patients with ST elevation myocardial infarction. *Heart Vessels* 2016;31:1767-75. [PUBMED](#) | [CROSSREF](#)
6. Ten Haaf ME, Rijndertse M, Cheng JM, et al. Sex differences in plaque characteristics by intravascular imaging in patients with coronary artery disease. *EuroIntervention* 2017;13:320-8. [PUBMED](#) | [CROSSREF](#)
7. Zhang J, Jiang J, Hu X, et al. Sex differences in fractional flow reserve- or intravascular ultrasound-guided percutaneous coronary intervention. *JACC Cardiovasc Interv* 2023;16:2426-35. [PUBMED](#) | [CROSSREF](#)
8. Kim HL, Park SM, Yoon HJ, et al. Clinical factors associated with three-year cardiovascular outcomes in women who underwent invasive coronary angiography: data from the KoRean wOmen'S chest pain rEgistry (KoROSE). *Korean Circ J* 2025;55:e79. [PUBMED](#) | [CROSSREF](#)
9. Kim HL, Kim MA. Sex differences in coronary artery disease: insights from the KoRean wOmen'S chest pain rEgistry (KoROSE). *Korean Circ J* 2023;53:655-76. [PUBMED](#) | [CROSSREF](#)
10. Kim HL, Kim HJ, Kim M, et al. Sex differences in coronary angiographic findings in patients with stable chest pain: analysis of data from the KoRean wOmen'S chest pain rEgistry (KoROSE). *Biol Sex Differ* 2022;13:2-12. [PUBMED](#) | [CROSSREF](#)