

Editorial



Gender Issues in Medical Decisions: Implicit Stereotyping and Unconscious Bias

Gi-Byoung Nam , MD

Department of Cardiology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

OPEN ACCESS

Received: May 3, 2018

Revised: May 24, 2018

Accepted: May 24, 2018

Correspondence to

Gi-Byoung Nam, MD


Department of Cardiology, Asan Medical Center, University of Ulsan College of Medicine, 88, Olympic-ro 43-gil, Songpa-gu, Seoul 05505, Korea.

E-mail: gbnam@amc.seoul.kr

Copyright © 2018. 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

Gi-Byoung Nam 

<https://orcid.org/0000-0003-4391-5406>

Conflict of Interest

The author has no financial conflicts of interest.

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

► See the article “Gender-related Differences in Management of Nonvalvular Atrial Fibrillation in an Asian Population” in volume 48 on page 519.

It is often said in medicine that children are not “little adults.” The same can be applied to gender issues in medicine. Sex differences are not strange considering that males and females differ by 1–2% in the total coding genome compared with the 1.06% difference in that between humans and chimpanzees.¹⁾ The term “gender difference” incorporates not only biological or physiological disparities (sex differences) but also other factors such as environmental, social, cultural, and behavioral components.¹⁾ Traditionally, gender has not been taken into consideration in medical research or practice, with males representing all human beings. It is now well known that diseases involving organs such as the heart, brain, and immune system differently affect males and females. Further, they differ in the prevalence, underlying pathophysiology, risk factors, mode of presentation, and response to therapy.

The most striking examples of gender differences in medicine are found in patients with a history of sudden cardiac arrest (SCA). The Brugada syndrome (BrS) and long QT syndrome (LQTS) are 2 representative ion channel diseases causing ventricular fibrillation and SCA in patients with a structurally normal heart.²⁾ LQTS is predominantly detected in females, whereas the majority (10:1) of patients affected by BrS are males. This striking gender difference in the clinical manifestation is explained by distinct differences in the electrophysiological properties between males and females. Unique differences in the distribution of specific potassium channels in the layers of ventricles elicit differential response to autonomic stimulation, electrolyte changes, or exposure to drugs. In human cardiac diseases, there are other examples demonstrating sex or gender differences. The development of coronary artery disease (CAD) is delayed by approximately 10 years in females, and the incidence of cardiovascular events is higher in males. Because SCA is mainly precipitated by the rupture of coronary atherosclerotic plaque, the incidence of SCA is also significantly higher in males. However, apart from the difference in the prevalence of CAD or SCA, more serious challenges arise from the differential gender response in the diagnosis or management of CAD. Because of the deep-rooted concept that females are more protected from CAD than are males, the risk of CAD is often overlooked in females, which may lead to a biased practice. Females with acute myocardial infarction (AMI) have a more unfavorable outcome than males. They are more prone to experience serious complications of AMI such

as cardiogenic shock, congestive heart failure, and re-infarction. Females with CAD are more likely to present with atypical symptoms, which may cause a delay in presentation or medical attention. Females are less likely to be referred for functional testing for ischemia and diagnostic angiograms. Because of the different clinical presentations, under-recognition of CAD, and biased practice patterns, females are less likely to receive evidence-based treatment or invasive procedures and, therefore, have worse outcomes from both chronic stable angina and acute coronary syndromes than males.³⁻⁵⁾

Another piece of evidence supporting the need for gender-based medicine was provided in this issue of the *Korean Circulation Journal*. Lee et al.⁶⁾ have reported gender perspectives in Korean atrial fibrillation (AF) epidemiology and practice patterns. The Comparison Study of Drugs for Symptom Control and Complication Prevention of AF (CODE-AF) registry is a large, prospective, observational cohort study from 10 tertiary hospitals representing all geographical regions of South Korea. This registry encompasses all treatment strategies in a population representative of Korean patients with AF. The authors reported that female patients with AF are more conservatively treated and rhythm control strategies are less frequently used in females than in males. In addition, they reported that an insufficient dosing of non-vitamin K antagonist oral anticoagulants is common in both sexes but is significantly more frequent in females.

Gender differences in AF prevalence and stroke risk have been previously reported. As is the case in patients with CAD, males show a higher risk of developing AF than females. This gender gap gradually decreases with advancing age. In general, female gender poses poorer outcomes in patients with AF. Females have a higher risk of stroke than males, and the mortality rate is higher for females than for males with AF.⁷⁾ The increased stroke risk in females is partly explained by baseline comorbidities and increased thrombogenicity (endothelial dysfunction, elevated prothrombotic factors, and increased platelet activation).^{7,8)} Despite these higher risks, as is the case in patients with CAD, females with AF are more conservatively treated with less rhythm control than males.⁹⁾

The results of the present Korean registry study are largely the same as those of previous studies. Notwithstanding this similarity, the authors are to be commended because the present study is timely and important considering the rapidly aging Korean population and the recently increased awareness regarding AF. There are insufficient data on AF and gender issues in the Asian population. Ethnic or racial issues are as important as gender differences, and this study is one of the few analyzing AF data in the Asian population. In contrast to Western patients with AF, gender differences in thromboembolic risks are not significant in the Asian population.^{7,10)} Taiwanese, Japanese, and Korean data suggest no significant difference in stroke risk between males and females.^{8,10)} It has been suggested that Asian patients should be differently approached for risk assessment and clinicians should use a risk stratification scheme for stroke other than the current CHADS-VASc score.

It is difficult to ignore an individual's personal experiences in medical practice. However, at the same time, all of us are subject to implicit stereotyping and unconscious bias in decision making, which is why current medical education and practice pursues evidence-based medicine. To overcome this inherent prejudice of humans, it may be of value to accelerate the introduction or application of artificial intelligence, big data, and precision medicine to provide more gender-based and individualized approaches in our daily practice.

REFERENCES

1. Richardson SS. Sexes, species, and genomes: why males and females are not like humans and chimpanzees. *Biol Philos* 2010;25:823-41.
[CROSSREF](#)
2. Kaufman ES. Mechanisms and clinical management of inherited channelopathies: long QT syndrome, Brugada syndrome, catecholaminergic polymorphic ventricular tachycardia, and short QT syndrome. *Heart Rhythm* 2009;6 Suppl:S51-5.
[PUBMED](#) | [CROSSREF](#)
3. Maas AH, Appelman YE. Gender differences in coronary heart disease. *Neth Heart J* 2010;18:598-602.
[PUBMED](#) | [CROSSREF](#)
4. Khamis RY, Ammari T, Mikhail GW. Gender differences in coronary heart disease. *Heart* 2016;102:1142-9.
[PUBMED](#) | [CROSSREF](#)
5. Roger VL, Go AS, Lloyd-Jones DM, et al. Heart disease and stroke statistics--2011 update: a report from the American Heart Association. *Circulation* 2011;123:e18-209.
[PUBMED](#) | [CROSSREF](#)
6. Lee JM, Kim TH, Cha MJ, et al. Gender-related differences in management of nonvalvular atrial fibrillation in an Asian population. *Korean Circ J* 2018;48:519-28.
[CROSSREF](#)
7. Lane DA, Lip GY. Female gender is a risk factor for stroke and thromboembolism in atrial fibrillation patients. *Thromb Haemost* 2009;101:802-5.
[PUBMED](#) | [CROSSREF](#)
8. Cheng EY, Kong MH. Gender differences of thromboembolic events in atrial fibrillation. *Am J Cardiol* 2016;117:1021-7.
[PUBMED](#) | [CROSSREF](#)
9. Dagues N, Nieuwlaat R, Vardas PE, et al. Gender-related differences in presentation, treatment, and outcome of patients with atrial fibrillation in Europe: a report from the Euro Heart Survey on Atrial Fibrillation. *J Am Coll Cardiol* 2007;49:572-7.
[PUBMED](#) | [CROSSREF](#)
10. Kang SH, Choi EK, Han KD, et al. Risk of ischemic stroke in patients with non-valvular atrial fibrillation not receiving oral anticoagulants - Korean nationwide population-based study. *Circ J* 2017;81:1158-64.
[PUBMED](#) | [CROSSREF](#)