Women are dying unnecessarily from cardiovascular disease

Editorial

Women are dying unnecessarily from cardiovascular disease

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Introduction

Cardiovascular disease (CVD) is the major cause of death and disability in women globally.[1] Yet compared with men, women, particularly younger women, are less likely to receive CVD screening, diagnostic testing, timely care, and invasive or reperfusion therapies,[2-4] all contributory factors to their potential misdiagnosis and poor management, experience and outcome. This is not a new phenomenon: in 1991, an entire generation ago, Healy described the Yentl syndrome, suggesting gender bias and disparity in the management of CVD.[5]

Such disparities are exemplified by findings from two recent large studies.[6,7] The first, a US community-based surveillance study spanning two decades,[6] found that the proportion of acute myocardial infarction (AMI) hospitalizations attributable to young patients increased, especially among women. Compared with young men, young women presenting with AMI had a lower likelihood of receiving guideline-based AMI therapies, were more often black and had a greater comorbidity burden.[6] The second, a prospective cohort study of individuals from urban and rural communities in 27 countries,[7] found that secondary prevention treatments, cardiac investigations and coronary revascularization were less frequent among women than men with coronary artery disease. Differences between women and men in treatments and outcomes were more marked among those in lower- to middle-income countries.

Sex and gender

Sex and gender issues are important considerations for clinical practice and research, though confusion between the two terms frequently persists. While historically the terms sex and gender have been used interchangeably, they are

different. In general, sex refers to the biological differences between males and females, whereas gender is a social construct and refers to the role of a male or female in society, or an individual's concept of themselves. Thus, in CVD we see the under-representation of women in clinical trials (sex disparity) and the stereotype that CVD is a 'man's disease' (gender disparity).

Why do sex and gender disparities persist in cardiovascular care and outcomes?

Pathophysiological differences between females and males, including differences in drug metabolising capacity, are well-established,[8] and have direct implications for medication efficacy and safety, yet clinical trials remain male dominated with minimal reporting of sex-specific adverse drug reactions.[9] The lack of evidence on the gender difference in the efficacy and safety of cardiovascular therapeutic interventions leads to poor appropriateness; thus, there is growing attention on the gender-related differences in the effects of cardiovascular drugs.[8] Females also have a higher incidence of micro-vascular disease, which can place them at higher risk for hospital readmissions and cardiovascular morbidity and mortality.[10]

Symptoms such as indigestion, nausea, vomiting, numbness and weakness are more prevalent in females than males but are often misdiagnosed, adversely affecting treatment and outcomes in females.[11] From a gender perspective, women are less likely to identify and seek timely care for heart attack symptoms, and once they do, providers do not deliver the same evidence-based care to women as they do to men.[3,4,11]

Regardless of the wealth of evidence identifying sex as one of the strongest effect modifier of cardiovascular risk and pathophysiology, consideration of sex in

clinical decision-making is often lacking.[2-4,8,11] For example, healthcare providers' suboptimal use of cardiovascular guideline recommended assessment and treatment in women continues,[4,12] despite sex-specific protocols and thresholds for diagnosis and treatment of myocardial infarction being shown to improve clinical outcomes in women.[13,14]

In hospital, women with STEMI are less likely than men to receive invasive management and revascularisation, be prescribed medications on discharge, and be referred for cardiac rehabilitation, resulting in a six-month mortality rate among women being twice that of men.[3] Similarly, women treated with percutaneous coronary intervention have significantly longer delays in presentation and revascularization and higher 30-day mortality than men[4] and are more likely to have major bleeding afterwards.[15] Out of hospital, women have lower chances than men to be resuscitated by bystanders and survive a cardiac arrest.[12]

A host of reasons may contribute to these disparities, including lack of awareness, low health literacy, language barriers, cultural and religious beliefs, low socioeconomic status, lack of sufficient insurance, and belonging to a black and minority ethnic group. Despite widespread media campaigns (e.g. American Heart Association and World Heart Federation 'Go Red for Women'), women's lack of attention to their heart health persists. Efforts to address these disparities include models such as Heart Centres for Women designed to increase awareness, improve education for women and their healthcare providers, expand research, and reduce barriers to cardiovascular care for women.[16]

Ignorance is no longer an excuse

Women and healthcare providers need to share responsibility in this troubling situation. Ignorance is no longer an excuse: women need to **know the facts** - *heart disease is the number one cause of death in women globally* - and **be proactive** - *by improving their awareness of symptoms*. As humans we are subject to inherent prejudice that can lead to bias, including unconscious bias (forming a quick opinion about a situation without being consciously aware of it), e.g. the underuse of screening for CVD risk in females compared to males,[2] and knowledge-mediated bias (neglecting patients belonging to the sex in which a disease is known to be less common), e.g. females less likely than males to receive treatment for acute coronary syndrome.[4] CVD screening and referral can be undertaken by a variety of healthcare providers, including the primary care physician and obstetrician, not just the cardiologist.

Though some of the sex-based differences in revascularization for acute coronary syndromes are warranted due to sex-based difference in the causes of acute coronary syndromes including spontaneous coronary artery dissection, micro-vascular disease, and apical ballooning syndrome, women are still less likely to receive timely revascularization for atherosclerotic causes of the acute coronary syndrome.[17]

The impact and cost - human and economic - of such inherent disparities in CVD are substantial and wholly unacceptable in an era when health services should offer access to and the provision of personalised, equitable, high quality care regardless of sex or gender, age, socioeconomic status, race or colour, or ability to pay.

What needs to be done?

Viewing the patient through a sex and gender lens should be the first step towards reducing such disparities that eventuate in the avoidable and often premature deaths of women. This step should serve as the basis of a systematic approach to:

- Increase awareness across health services of CVD gender stereotypes and sex disparities
- Provide sex-specific CVD education and training for all healthcare providers
- Offer routine screening of sex-specific CVD risk by primary care providers
- Recruit more women into CVD clinical trials
- Implement sex-specific CVD guidelines
- Promote women's cardiovascular health in the community
- Advance women in science to take control of this important health problem

These steps should be adopted as a matter of routine in contemporary cardiovascular care. Only then can we hope to see improvements across the patient care trajectory. This will entail a collaborative and concerted effort from healthcare providers, researchers, educators, patients and families, community members and opinion leaders to ensure they understand that sex and gender matter when making decisions about CVD diagnosis, management and outcomes.

A recent editorial in The Lancet noted, in relation to the disproportionately higher mortality in women with CVD than men, that many assumptions among the public and professions about who gets and dies from the disease are wrong and a major shift in thinking is required. The editorial also notes that structural bias in cardiology stems from its failure to ensure gender balance in its research and that this imbalanced approach to cardiology research has "led to fundamental flaws in the

care for women with heart disease and has cost the lives of many women".[18] We should no longer tolerate this unacceptable state of affairs.

Conclusion

Major disparities between women and men in the prevention, diagnosis, management, and outcomes of cardiovascular disease persist. These disparities are unacceptable in contemporary cardiovascular care and concerted efforts are needed to address them, including raising awareness among women, healthcare providers and the general public, recruiting more women into clinical trials, and involving women as true partners in decision-making, including choices and preferences, about their care and outcomes.

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