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VIEWPOINT

VOICES IN CARDIOLOGY

Why Are We Not There Yet?

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INTRODUCTION

Despite major advances in cardiovascular disease prevention, diagnosis, and therapies for women in the past decades, cardiovascular disease remains their leading cause of morbidity and mortality. Although considered a problem predominantly for men in the past century, the emergence of sex-specific recommendations for women dramatically decreased their cardiovascular mortality, beginning in the year 2000. By 2013 to 2014, for the first time, fewer women than men died annually from cardiovascular disease (**Figure 1**).

AWARENESS OF CARDIOVASCULAR RISK AMONG WOMEN

The educational campaigns of the National Heart, Lung, and Blood Institute (Heart Truth Campaign) and the American Heart Association (Go Red for Women) beginning in 2004, coupled with educational programs about heart disease in women from WomenHeart and other professional scientific organizations, raised the awareness of cardiovascular disease as the leading cause of death in women from 30% to 56% by 2009. A recent alarming report from the American Heart Association (1) showed that knowledge of cardiovascular disease as the leading cause of death in women had declined to 44% by 2019, with the lessened awareness particularly notable among Hispanics, Blacks, and young women. Awareness of heart attack symptoms declined concomitantly. As noted by Sharma et al. (2), we have lost a decade because this decrease in awareness has been accompanied by an increase in cardiovascular mortality among young women, erasing the advances of the several decades. This mandates a call to action to increase the culturally appropriate education to raise awareness of cardiovascular risk factors and the signs and symptoms of myocardial infarction, a task that requires a consortium of community-based organizations.

The intervention requires escalation of education for awareness, coupled with cardiovascular screening and counseling, and cooperation with obstetric/gynecology colleagues as another component of inclusiveness. Cardiovascular health levels are significantly lower in pregnant as compared with nonpregnant U.S. women age 20 to 44 years (3). Fewer than 1 in 10 pregnant women currently have high cardiovascular health per the American Heart Association's Life's Simple Seven. This is a likely contribution to the increased occurrence of preeclampsia, which has escalated almost 20-fold in recent years.

The goal of these efforts is to ensure equitable health care, in this instance cardiovascular care, for women. Recognize that equitable is not synonymous with equal. Equal implies sameness, regardless of the need, whereas the determinant of equitable is fairness; in this setting it requires that the interventions engender a comparable favorable outcome for women.

Concomitantly, there must be increased education of health care professionals such that the importance of sex as a biologic variable is an intrinsic component of professional education curricula. Included are female-specific issues in cardiovascular disease, highlighting cardiovascular syndromes that predominate in women and displaying differences in the approach to prevention of cardiovascular disease in women. As noted in the American College of Cardiology/American Heart Association Primary Prevention Guideline (4), several issues specific to women are included among the risk-enhancing factors. Particularly important is a history of premature

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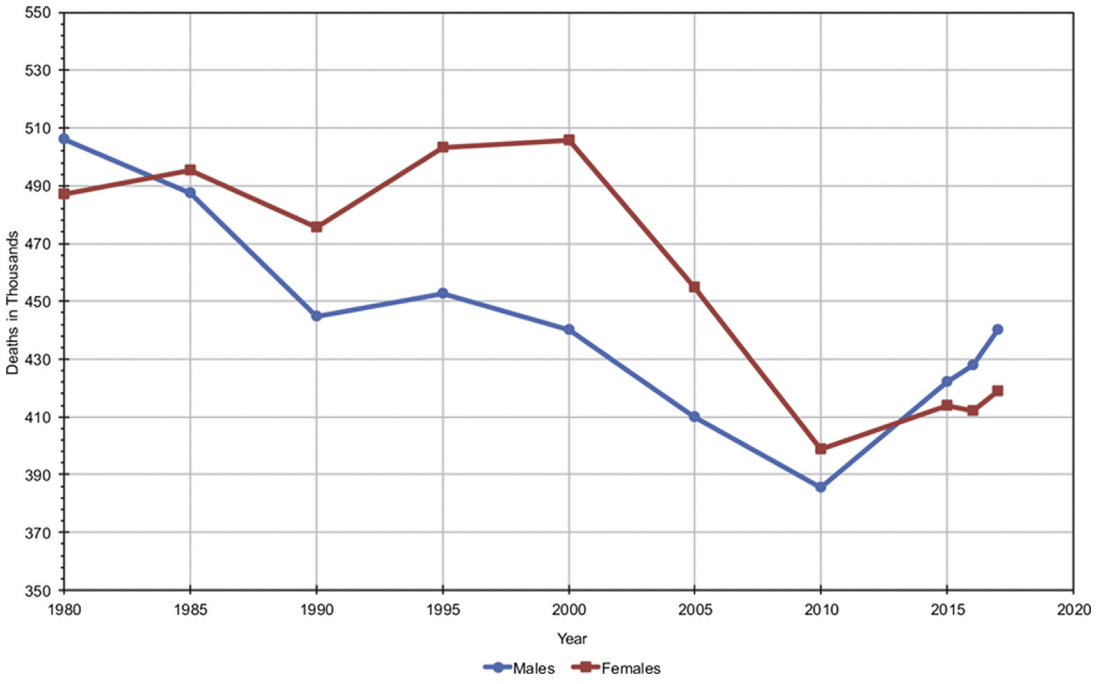
FIGURE 1 Cardiovascular Disease Mortality Trends for U.S. Males and Females, 1980 to 2017



Cardiovascular disease excludes congenital cardiovascular defects (International Classification of Diseases-10th Revision codes I00 to I99). The overall comparability for cardiovascular disease between the International Classification of Diseases-9th Revision (1979 to 1998) and International Classification of Diseases-10th Revision (1999 to 2015) is 0.9962. No comparability ratios were applied. Data from National Heart, Lung, and Blood Institute tabulation using National Vital Statistics System. Reproduced with permission from Virani SS, Alonso A, Benjamin EJ, et al. Heart disease and stroke statistics—2020 update: a report from the American Heart Association. Circulation 2020;141:e139–e596.

menopause and a history of pregnancy-associated conditions, such as preeclampsia.

WOMEN IN CARDIOLOGY AND WOMEN AS LEADERS

Although completely acknowledging the value and contributions of our male colleagues, the underrepresentation of women in cardiology deprives this nation of a sizeable pool of clinical and research resources and talent. And it is not simply the representation of women, but the advancement of women in their biomedical careers to permit them to reach their full potential.

Sadly, there is a leaky pipeline for U.S. women in medicine (5). Currently, more than 50% of internal medicine residents are women, declining to a 21% representation among cardiology fellows, and 17% as cardiology faculty. Within the faculty, there are fewer women full professors, division directors, and department chairs, with even scarcer medical school deans.

Cardiology journal editorial boards have only about 15% female members. The same is the problem in clinical trial leadership for cardiovascular trials (6). More than one-half of all trials had no female leadership and only 1 in 10 had women as first or last authors on the trial publication in reports of major cardiovascular clinical trials. I venture to suggest that the lack of inclusiveness of women in academic medicine and academic cardiology contributes to the underrepresentation of women participants in clinical trials.

But there is light at the end of the tunnel. With increasing emphasis on diversity in national and international cardiovascular meetings, we have seen emerging women leaders in cardiovascular professional societies, increasing representation of women on national and international meeting panels, and the burgeoning of Women in Cardiology groups locally,

regionally, nationally, and internationally, where networking and leadership skills and advocacy are honed.

COVID-19, WOMEN, AND CARDIOVASCULAR DISEASE

COVID-19 has highlighted the importance of the social determinants of health and the requirements for increased attention to vulnerable populations. COVID has had a major adverse career impact, particularly on women and women with children who, in addition to their clinical and research responsibilities, have had to assume roles of child care, education, playground monitor, and so forth. The response of academic cardiology to this challenge is evolving regarding tenure track modifications and varied supportive features.

THE RESEARCH FOR ALL ACT OF 2015

Recommendations and guidelines for inclusion of women and minorities in clinical research studies at the National Institutes of Health and in recommendations to industry from the Food and Drug Administration have been promulgated over the years. The 2015 Research for All Act (7) now provides legislation. At the National Institutes of Health, basic researchers must identify the sex of cells, tissues, and animals, and the research results must ensure appropriate sex representation and be disaggregated by sex. It remains amazing that our basic science colleagues often did not know the provenance of their cells, tissues, and animals, such that problems of women may have been studied in male cells and tissues. For the clinical research community, there is the requirement for the appropriate inclusion of women and minorities, with detailed plans to ensure recruitment and with research results disaggregated by sex.

In 2020, the Food and Drug Administration issued a Guide for Industry, with recommendation that representative populations be included, but there was no provision for enforcement; this poses a major challenge to the research community. As I have stated in other settings, there is a 4-step progression for advancing women's cardiovascular health: 1) investigate; 2) educate; 3) advocate; and 4) as needed, legislate.

CONCLUSIONS

The challenge to the cardiovascular community is to increase diversity and improve inclusiveness. This is requisite to ensure equitable cardiovascular care for women and equitable cardiovascular leadership opportunities for women.

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