The Female Heart Is Vulnerable to Cardiovascular Disease

Emerging Prevention Evidence for Women Must Inform Emerging Prevention Strategies for Women

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Not half a century ago, cardiovascular and coronary heart disease were viewed both by the clinical practice community and the general public as a male problem. Witness a 1960s American Heart Association conference on women and cardiovascular disease titled “How Can I Help My Husband Cope with Heart Disease?” and the initial introduction of the American Heart Association’s Prudent Diet in a public education pamphlet entitled “The Way to a Man’s Heart.” Index items of “women” or “female” were notably absent from the Scientific Sessions programs of the major national cardiac societies, in contrast to contemporary multiple entries and sessions devoted to heart disease in women.

Articles see pp 120, 128, 135, and 143

In 2001, the landmark Institute of Medicine Report, Exploring the Biological Contributions to Human Health: Does Sex Matter?1 advocated better understanding of the differences in human disease between the sexes, with subsequent translation of these differences into clinical practice. The traditional underrepresentation of women in clinical research studies was highlighted as problematic in the Institute of Medicine report. Once the research information defines differences in the way women and men react to diseases and to treatments of disease, the challenge to the clinical community is to incorporate this knowledge into their preventive, diagnostic, and therapeutic practices. Equally pivotal in expanding the database for women were requirements by the General Accounting Office of inclusion of women in all National Institutes of Health–sponsored research, with analysis of outcomes by sex, as well as reporting of sex differences in clinical trials of new drugs in the applications submitted to the US Food and Drug Administration. Exploration of these sex-related differences provides a basis for clinical strategies to improve outcomes for women.

Since 2000, there has been a steady, consecutive yearly decline in heart disease deaths among women, with a resultant decrease of almost 17 000 female deaths between 2003 and 2004; however, the major contributor to the increased survival appeared to be improved care of established cardiovascular disease rather than a decrease in the occurrence of new cases of cardiovascular disease in women, emphasizing the need for preventive interventions.

In contemporary practice, physicians often underestimate the coronary disease risk for women, with consequent absent or suboptimal recommendations for coronary disease prevention. The 2007 update to the Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women was designed to simplify the risk categorization of women—both for health care practitioners and for women—and to recommend a graded intensity of preventive intervention based on the intensity of risk. Women were categorized as high risk, at risk, or optimal risk status.2

Hsia et al3 evaluated this simplified approach to risk stratification among participants in the Women’s Health Initiative and compared the outcomes with those based on the Framingham Risk Score. The new guideline risk stratification approach identified cardiovascular risk with an accuracy similar to that of the current Framingham algorithm (<10%, 10% to 20%, >20%). This is faint praise, as the guideline-based risk approach performed less well than the proposed Framingham 10-year risk category (<5%, 5% to 20%, >20%). If adequately promoted, is the simplified approach more likely to be used and to enhance prevention interventions for women? However, the population for scrutiny for validation encompassed women ages 50 to 79 years at Women’s Health Initiative enrollment who were followed for a mean of 7.8 years. What is needed is a comparison with the Framingham Risk Score in younger women, in whom the Framingham Risk Score traditionally underestimates their risk and hence their need for preventive interventions. The challenge remains to validly identify the younger woman at increased risk, given the unfavorable coronary disease mortality trends among US young adults between 1980 and 2002, which were particularly prominent for women.4 There was a 5.4% mortality rate decline between 1980 and 1989 among women ages 35 to 54 years, which decreased to 1.2% between 1989 and 2000, but increased to 1.5% between 2000 and 2002. The author of the article refers to this phenomenon as “the leading edge of a brewing storm.”

Further addressing the prevention component, Melloni et al5 reviewed the randomized clinical trials that formed the basis for the 2007 American Heart Association (AHA) Guidelines for Cardiovascular Disease Prevention in Women. They highlighted the underrepresentation of women in the clinical trials relative to the prevalence of women with the disease—in this case, 29% and 25%, respectively, for clinical trials of heart failure and coronary artery disease, in contrast to women representing 51% and 46% of the population with...
heart failure and coronary disease, respectively. Thus, although the enrollment of women in randomized prevention trials increased over time, and, particularly so in the international rather than the US prevention trials, the representation of women remains unacceptably low relative to their overall presence in disease populations. Age-based exclusion of older persons from clinical trials doubly disadvantages women, given their disproportionate representation in elderly populations. This defines the compelling need to examine barriers to the enrollment of women and of older women in clinical trials and to institute strategies to overcome these barriers.

Because of the linking of awareness of cardiovascular risk to the implementation of preventive strategies by women, serial surveys were undertaken by the AHA from 1997 to 2009, with the latest reported by Mosca et al. Although the surveys had reasonable representation of the population at ages ≥65, the representation of older women of advanced age is not described; specific data are needed regarding prevention in older women. Intensive public education campaigns for more than a decade by the AHA (the “Go Red for Women” campaign), the National Heart, Lung, and Blood Institute (the “Heart Truth Campaign”), and others resulted in an increased awareness of cardiovascular risk among women—54% in 2009 compared with 30% in 1997—but is this a glass half-empty or a glass half-full? The failure for awareness to increase in recent years and the persistence of unacceptably low awareness in women of racial and ethnic minorities pose continuing challenges. Even aware women did not display appropriate responses to acute coronary symptoms, and most women surveyed cited non—evidence-based therapies as approaches for coronary disease prevention—offering a challenge both to public education campaigns and to physician education of the women in their practices regarding cardiovascular disease risk and prevention. Communities must also become participants in coronary disease preventive efforts, given the women’s reports of environmental features that might facilitate lifestyle preventive interventions. The 2007 guideline update also focuses on lifetime risk, in that a low Framingham Risk Score may be falsely reassuring to young women. A particular unmet need is prevention at younger age, the subset of women less likely to undertake preventive behaviors—here the guideline emphasis of lifetime risk may prove a valuable concept to encourage prevention. How we translate disease awareness into personalization of risk and risk reduction in women is the next behavioral research frontier.

The 2007 Women’s Prevention Guidelines recommended assessment of depression in women with established coronary disease, a recommendation subsequently published by the AHA7 for patients of either sex with coronary disease. Psychosocial features of cardiovascular disease have been understudied in men and women. The detailed report of Leifheit-Limson et al8 identifies the role of social support in women and men during the first year of recovery after myocardial infarction, characterizing lower social support as associated with worse health status and more depressive symptoms, but particularly so for women. There is need for the research community to clarify the mechanisms whereby social support provides benefit and to define whether sex-specific interventions are warranted. A broader challenge is to explore a more diverse landscape of psychosocial/environmental/sociocultural disciplines and their relationship(s) to cardiovascular illness, including differential impacts by sex.

Expanding the agenda of the cardiovascular research community and the spectrum of expertise of its scholars clearly should further encompass political (including public policy), economic, business, ethical, legal and regulatory, community (global, regional, local), faith-based, and cultural associations and interrelationships. This extension of the conceptualization of women’s cardiovascular health may help clarify differential disease prevalence among women across populations.

Disclosures

None.

References


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