Evidence Report/Technology Assessment
Number 80

Results of Systematic Review of Research on Diagnosis and Treatment of Coronary Heart Disease in Women

Prepared for:
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
www.ahrq.gov

Contract No. 290-97-0013

Prepared by:
University of California, San Francisco-Stanford University Evidence-based Practice Center, Stanford, CA

Principal Investigator
Deborah Grady, MD, MPH
EPC Coordinator
Kathryn McDonald, MM
EPC Staff
Kara Bischoff
Aurelie Cabou
Lily Chaput, MD, MPH
Kate Hoerster
Margaret Kristof, MS, RN
Cyrus Shahpar, MPH
Judith Walsh, MD, MPH
UCSF/Mt. Zion Fishbon Librarians
Gail Sorrough, MLIS
Gloria Won, MLIS

AHRQ Publication No. 03-E035
May 2003

This document is in the public domain and may be used and reprinted without permission except those copyrighted materials noted for which further reproduction is prohibited without the specific permission of copyright holders.

Suggested Citation:
Grady D, Chaput L, Kristof M. Results of Systematic Review of Research on Diagnosis and Treatment of Coronary Heart Disease in Women. Evidence Report/Technology Assessment No. 80. (Prepared by the University of California, San Francisco-Stanford Evidence-based Practice Center under Contract No 290-97-0013.) AHRQ Publication No. 03-0035. Rockville, MD: Agency for Healthcare Research and Quality. May 2003.

This report may be used, in whole or in part, as the basis for development of clinical practice guidelines and other quality enhancement tools, or a basis for reimbursement and coverage policies. AHRQ or U.S. Department of Health and Human Services endorsement of such derivative products may not be stated or implied.

AHRQ is the lead Federal agency charged with supporting research designed to improve the quality of health care, reduce its cost, address patient safety and medical errors, and broaden access to essential services. AHRQ sponsors and conducts research that provides evidence-based information on health care outcomes; quality; and cost, use, and access. The information helps health care decisionmakers—patients and clinicians, health system leaders, and policymakers—make more informed decisions and improve the quality of health care services.

Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-Based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

To bring the broadest range of experts into the development of evidence reports and health technology assessments, AHRQ encourages the EPCs to form partnerships and enter into collaborations with other medical and research organizations. The EPCs work with these partner organizations to ensure that the evidence reports and technology assessments they produce will become building blocks for health care quality improvement projects throughout the Nation. The reports undergo peer review prior to their release.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the health care system as a whole by providing important information to help improve health care quality.

We welcome written comments on this evidence report. They may be sent to: Director, Center for Practice and Technology Assessment, Agency for Healthcare Research and Quality, 6010 Executive Blvd., Suite 300, Rockville, MD 20852.

Carolyn M. Clancy, M.D.
Director
Agency for Healthcare Research and Quality

Jean Slutsky, P.A., M.S.P.H.
Acting Director, Center for Practice and Technology Assessment
Agency for Healthcare Research and Quality

The authors of this report are responsible for its content. Statements in the report should not be construed as endorsement by the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services of a particular drug, device, test, treatment, or other clinical service.

Structured Abstract

Objectives. The Agency for Healthcare Research and Quality and several partner organizations charged the University of California, San Francisco-Stanford Evidence-based Practice Center to review the evidence on five key topics related to coronary heart disease (CHD) in women: (1) accuracy of noninvasive testing for diagnosis of CHD; (2) efficacy of treatments; (3) strength of risk factors and efficacy of risk factor reduction; (4) utilization of tests and treatments in men compared to women, and (5) accuracy of biomarkers for diagnosis of myocardial infarction. These five key questions included 42 discrete subtopics. We used standard methods to systematically review the medical literature to address each subtopic. The evidence identified was reviewed, graded and summarized for each subtopic and further research was recommended as appropriate.

Search Strategy. We identified 6,403 citations from searching electronic databases from 1985 through July 2001, reviewing bibliographies, and by recommendation from our peer reviewers.

Selection Criteria. After the titles were screened, abstracts were reviewed independently by two investigators who coded each abstract for eligibility for full text review. In order to be categorized as providing evidence regarding a research question, the article had to address the predictor variable and the clinical outcome and contain data to address the question specifically in women. Articles meeting inclusion criteria were abstracted independently on a standardized form by two investigators, and received a quality score based on predefined criteria. All studies rated good or fair were included in this review.

Data Collection and Analysis. The titles and abstracts were entered and coded in EndNote® files. Data from the standardized review form was entered into a Microsoft® Access database, which allowed tracking of the eligibility, quality and type of study of each article reviewed.

Main Results. We reviewed the full text of 819 articles and found 162 that provided evidence in women. We found no data in women to address 13 of the subtopics, weak data to address 15, fair data for eight and good data to address six.

- Fair evidence suggests that the accuracy of exercise EKG and exercise thallium testing for CHD in women is low. The accuracy of exercise echocardiography appears to be higher, but data are limited.
- Fair or good evidence suggests that beta-blockers, aspirin and angiotensin converting enzyme inhibitors reduce risk for CHD events and that nitrates are ineffective in women with known heart disease.
- Fair evidence suggests that glycoprotein IIb/IIIa inhibitor drugs given to women undergoing percutaneous revascularization result in a reduced risk of CHD events and need for revascularization, but treatment of women suffering acute coronary syndromes may result in increased mortality. This was the only treatment for which there was evidence of a possible interaction by gender: men treated with IIb/IIIa drugs during acute coronary syndromes appear to benefit.

- Fair or good evidence suggests that hyperlipidemia, diabetes, and hyperhomocysteinemia are risk factors for CHD in women.
- Fair or good evidence suggests that smoking cessation after MI and treatment of hypertension and hyperlipidemia lower risk for CHD events in women.
- We found little evidence to address the key questions in women of different races or ethnicities. The only evidence regarding differences by ethnicity suggests that African-American women may benefit more from treatment of hypertension than white women.

Conclusions. New or updated systematic reviews of the literature appear to be feasible and would likely provide clinically important information for 14 of the subtopics. The major limitation in performing these systematic reviews is that data stratified by gender and race/ethnicity from completed studies may not available. We recommend that, in addition to requiring participation of women and minorities in research, the National Institutes of Health, U.S. Food and Drug Administration and other funding and regulatory agencies insist that outcome data by subgroup be published or archived.

Contents

Summary 1

Evidence Report 9

Chapter 1. Introduction 11
Coronary Heart Disease in Women 11
Approaches to Improving Evidence on Diagnosis and Treatment of CHD in Women 12
Key Questions 12
Chapter 2. Methodology 17
Identification of Evidence 17
Data Sources 17
Search Terms 17
Inclusion Criteria 15
Article Identification 18
Quality Assessment 18
Completeness 19
Data Management and Archive 20
Results of Literature Searches 20
Summary of Evidence 21
Hierarchy of Evidence and Completeness of Searches 21
Summary of Studies 22
Evidence by Ethnicity 23
Abbreviations 23
Chapter 3. Results 27
Results by Key Question 27
Question 1: Are there accurate non-invasive approaches to evaluating suspected coronary disease in women? 27
Question 2: Are there effective treatments for women with coronary heart disease? 34
Question 3: What are the risk factors for coronary heart disease in women? Does modifying these risk factors result in reduced events, and what are the most effective methods for modifying these risk factors? 63
Question 4: Are accurate tests, effective treatments, or risk factor modifications underutilized in women compared to men or among women of various race/ethnic populations? 93
Question 5: What is the prognostic value of biochemical markers for acute myocardial infarction or unstable angina in women? 102
Chapter 4. Conclusions 103
Summary and Recommendations by Key Question 103
Findings by Level of Evidence and Key Question 103
Summary of Major Findings 103
Chapter 5. Future Research 115

Figures

Figure 1. Process for Identification of Evidence 24

Tables

Table 1. List of Key Questions 14
Table 2. Articles Identified by Key Question and Topic 25
Table 3. Summary and Recommendations by Key Question 105
Table 4. Findings by Level of Evidence and Key Question 113
Table 5. Findings by Level of Evidence and Recommendation for Systematic Review 116

References 117

Evidence Tables 125
Table 1. Articles Containing Evidence on Key Questions 127

Bibliography 143

Appendixes 177
Appendix A. Technical Expert Advisory Board and Expert Consultants 181
Appendix B. Literature Search Terms 185
Appendix C. Full-Text Article Abstraction Form 191
Appendix D. Articles Eligible for Full Text Review by Key Question 195
Appendix E. Cost-effectiveness Analyses 253
Appendix F. Clinical Practice Guidelines 257
Appendix G. Evidence Reports 263
Appendix H. Abbreviations and Acronyms 267