

Symptom Presentation of Women With Acute Coronary Syndromes

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Coronary artery disease is the leading cause of morbidity and mortality among women in the United States.¹ Optimal diagnosis and timely treatment of acute coronary syndromes/myocardial infarction (ACS/MI), especially reducing patient-associated delay in seeking medical care, are critical.

FOCUSPOINT

Are gender differences significant enough to warrant separate public health messages for women and men regarding ACS symptoms?

The purposes of this review are to examine the literature on presenting symptoms of ACS/MI in women compared with those of men and, based on this evidence, to ascertain whether gender differences are significant enough to warrant separate public health messages for women and men regarding ACS symptoms.

DEFINITION OF ACUTE CORONARY SYMPTOMS

The typical symptoms of myocardial ischemia are well known. Broadly speaking, they include:

- precordial chest discomfort, pain, heaviness, fullness, possibly radiating to the arm, shoulder, back, neck, jaw, epigastrium, or other location
- symptoms exacerbated by exertion or stress
- symptoms that may be relieved by rest or use of nitroglycerin
- symptoms associated with shortness of breath, diaphoresis, weakness, nausea or vomiting, and light-headedness.

“Atypical” chest pain/discomfort has been described as:

- not severe
- not prolonged
- not classical in presentation
- not exactly like prior cardiac symptoms
- burning, sharp, pleuritic, positional
- reproducible on palpation of the chest wall
- localizable by one finger or a pain/discomfort in areas of the upper body other than the chest, such as the arms, epigastrium, shoulder, and neck.

Symptoms occurring in the ACS setting without chest pain/discomfort have been described, and are also frequently labeled as “atypical.”² These include:

- unexplained shortness of breath, especially in those who present with ACS
- pain/discomfort in other body locations, such as that localized to the arm(s), shoulder, mid-back, jaw, or epigastrium
- indigestion
- nausea or vomiting
- diaphoresis
- faintness or dizziness
- fatigue
- generalized weakness
- palpitations
- cardiac arrhythmias
- syncope

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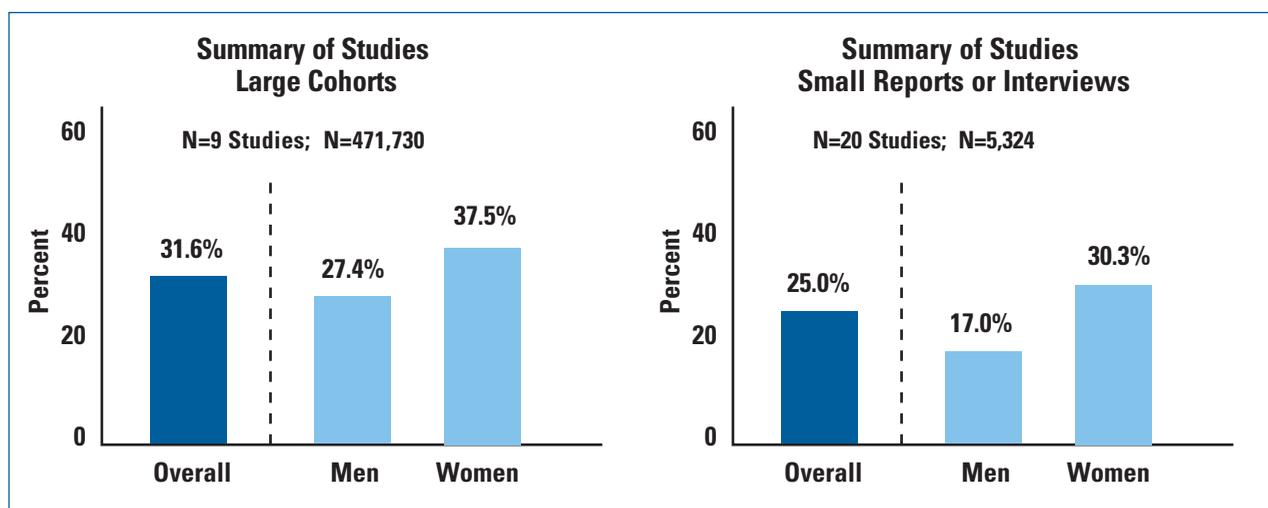


FIGURE. Acute coronary syndrome presentation without chest pain or discomfort according to gender.

- cardiac arrest
- central nervous system manifestations with “stroke-like” symptoms, including numbness or unexplained confusion.

Each of these symptoms may occur alone or in combination, and in the presence or absence of chest discomfort.

GENDER DIFFERENCES IN CLINICAL PRESENTATION OF ACS

Studies from large cohorts and those based on small reports or personal interviews suggest that approximately 1/3 of patients in the large cohort studies and 1/4 of patients in the smaller reports and interviews presented without chest pain/discomfort (Figure).³ The absence of chest pain/discomfort with ACS was noted more commonly in women than in men in the cumulative summary of large cohort studies (37% versus 27%) and in the single-center/small reports or interviews (30% versus 17%) (Figure).

The frequency of other associated symptoms with ACS differs between women and men. Generally, women are more likely than men to experience middle or upper back pain, neck pain, jaw pain, shortness of breath, paroxysmal nocturnal dyspnea, nausea or vomiting, indigestion, loss of appetite, weakness or fatigue, cough, dizziness, and palpitations. Differences in the frequency of diaphoresis have been inconsistent between men and women. Women appear to have a greater number of associated symptoms as part of their ACS

presentation as compared with men (average of 2.6 symptoms in women versus 1.8 in men).³

AGE AND SYMPTOM PRESENTATION OF ACS

Advanced age is arguably a more important predictor of ACS presentation than gender in the absence of chest pain/discomfort.³ Although women are generally older than men at the time of hospitalization for MI, only a limited number of studies have adjusted for age in examining possible gender differences in ACS clinical presentation. In a

prospective study of more than 434,000 patients with confirmed MI in the National Registry of Myocardial Infarction,² increasing age (10-year intervals, odds ratio=1.28) had a stronger association with MI and the absence of chest discomfort than did female gender (odds ratio=1.06).⁴ Among Medicare beneficiaries with unstable angina in the state of Alabama in this primarily elderly cohort (mean age=72 years), increasing age was the most important predictor of ACS presentation in the absence of chest discomfort while female gender was not.⁵ Similarly, in 2 separate studies from the population-based Worcester Heart Attack Study,^{6,7} the overall MI prevalence without chest pain was 20% and 33%, respectively,

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and occurred with greater frequency in women than in men. However, after multivariate analysis, gender was no longer an important predictor of MI without chest pain⁶ and was only a marginal predictor in women 75 years and older.⁷

DISCUSSION

The literature lacks standardization in characterizing ACS presentation, data collection, and reporting on women's symptoms, which makes it difficult to provide definitive conclusions or recommendations.

Nevertheless, this review may help provide a framework for public and professional communication about the presenting symptoms of ACS in women as well as men, and may provide the impetus for clinical trials and epidemiological studies in ACS to create more standardized symptom definitions and data collection. We report that approximately 1/3 of patients in the large cohort studies and 1/4 of patients in the smaller reports and interviews presented without chest pain/discomfort, with the absence of chest pain/discomfort being noted more commonly in women than in men. However, these potential differences are not likely to be significant enough at this time to warrant a separate or different message for awareness of ACS symptoms in women as compared to men.

Our findings suggest that age may be an important contributor to any sex-based differences in ACS presentation. Older age is associated with less frequent reporting of chest pain/discomfort as an ACS-presenting characteristic. This is important, as women with ACS are older than men, but this point needs to be confirmed in well-designed studies. From a public health perspective, women, by virtue of being older when they present with ACS, may, in fact, have a different presentation than men. Until more detailed data are available, it is our opinion that the present public health message on symptom presentation should not be altered for women or men.

In general, publications comparing gender differences in ACS presentation have several important limitations. First, there is a lack of standardization in data collection and reporting on women's principal or associated ACS symptoms. Thus, given the potential for biased

results in the face of marked heterogeneity of the studies on symptom presentation, a formal meta-analysis was not performed. Second, a number of studies have only included ACS patients who presented with chest pain/discomfort and do not provide data on ACS patients without chest discomfort. Third, chest pain/discomfort is often lumped together with pain/discomfort localized to other areas of the upper body in the absence of chest symptoms. These studies are not included in our overall estimates.

The range of symptoms highlighted in this review is currently encompassed in the existing heart attack symptom message promoted by the National Heart, Lung, and Blood Institute (NHLBI) and the American Heart Association (AHA) in NHLBI's *Act in Time to Heart Attack Signs* (www.nhlbi.nih.gov/actintime) campaign. The campaign, launched in cooperation with the AHA and other partners, aims to educate Americans about warning signs of ACS/MI and the importance of calling 911 immediately. Based on the available evidence, the current AHA and NHLBI heart attack symptom message, which targets women and men equally, should remain unchanged. Further research is needed to investigate potential age as well as gender differences in the clinical presentation of ACS symptoms, and must include standardized data collection efforts.

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