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Myocardial Infarction (MI) in Women

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Introduction

Cardiovascular disease (CAD) is the most common cause of death for men and women in the US. The disease has been extensively studied in males (Gulati & Bairey Merz, 2012, p. 141). CVD poses an obvious challenge to the health of women. Coronary heart disease (CHD) is described as a "modern epidemic" (Banner, 2010, p. 3123). Although, the prevalence of CVD has prompted many studies for prevention and treatment, little is known about CVD in women. It is now known that the mortality rates in women have surpassed that of men. Recent reports indicate that CVD killed more women in three decades than men. In the US, 421, 311 women died from the disease (Strain-Strand et al, 2011, p. 459; Gulati & Bairey Merz, 2012, p. 141).

- The population of men and women with CVD is expected to rise by 1.5% annually, as more men and women seek treatment for ischemic pains and Infarction (Sancho & del Carmen, 2011, p. 1463).
- More women have died from CVD and the probability of a woman to die from CVD has increased more than eight times. Women remain less aware of the unique symptoms of the disease (Sjöström-Strand et al, 2011, p. 459).

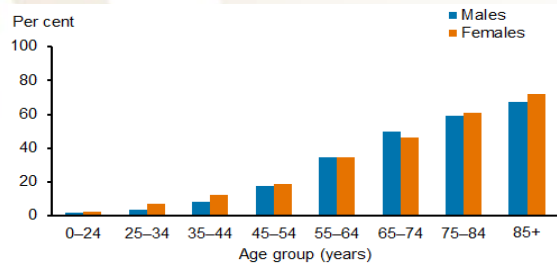
Unique Presentation in Women

MI is associated with countless signs and symptoms (s/s) and some specific characteristics that frequently assist in identifying the underlying pathology

- Atypical s/s in female patients are fatigue, sleep disturbance, dyspnea and diminished functional capacity (Edwards, 2012, p. 575; Coventry et al, 2013).
- Classic chest pain that characterized MI in men is quite unusual in women.
- 50-60% first sign of heart disease was either acute MI or sudden cardiac death.
- The clinical outcomes for women presenting with chest discomfort has always been worse (Mieres et al, 2011, p.1266; Edwards, 2012, p. 575).

- C/o chest pains in a woman can best serve as a predictor adverse CVA event in the absence obstructive CAD.
- Women c/o chest pain while at rest & lasts longer than usual.
- MI in women is preceded by s/s of back pain, arm, shoulder, jaw, throat pain and toothache.
- Hormonal changes experienced after menopause plays a critical role. Reduced estrogen causes lipid dysfunctions and significantly increases the incidence of MI (Edwards 2012, p. 576; Gulati & Bairey Merz, 2012, p. 142).

The chart below shows the proportion of male and female with CAD by age and sex, 2007-2008 adapted from www.ahw.gov.au/cardiovascular-health/prevalence/

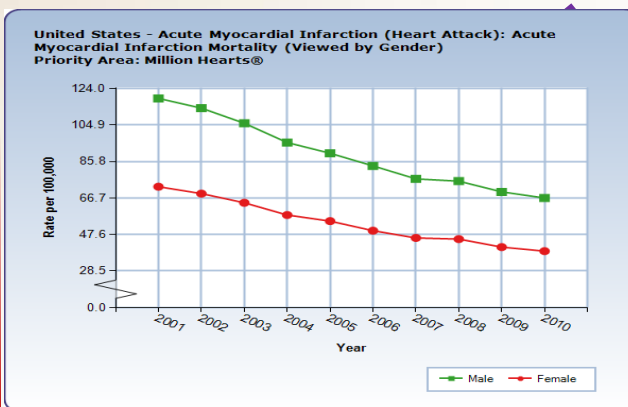


Pathophysiology of MI

Generally, CHD has been considered as a disease characterized by the presence of lesions in the surface of the coronary arteries of the heart. However, numerous studies have revealed that the pathological processes of CHD in women does not follow the previously established pattern of the disease. Research studies have shown that women who undergo coronary angiography studies for chest pains usually show no evidence of obstructive disease (Edwards, 2012, p. 575; Gulati & Bairey Merz, 2012, p. 142). This was generally accepted that the presence of "clear arteries" on diagnostic tests indicated low cardiac risk.

But recent studies have demonstrated that this conclusion does not hold true for female patients. This has been substantiated by evidence from the Women's Ischemia Syndrome Evaluation (WISE) studies stating that coronary microvascular dysfunction is present in over 50 percent of women without obstructive disease.

Obstructive disease or stenosis of the coronary arteries is defined as occlusion of the vessel of the lumen greater or equal 50 percent. These women had poorer outcome even in the absence obstructive lesion. In addition to the above, it has also been noted that many of these women demonstrated abnormal stress test results which could be indicative of ischemia and/or microvascular dysfunction (Edwards, 2012, p. 575; Gulati & Bairey Merz, 2012, p. 142).



The chart above indicates the mortality rate of Acute MI for both men and women adapted from <http://nccd.cdc.gov>

Coronary microvascular disease is a disorder affecting the small coronary arteries of the heart. These changes in the lumen of the arteries are not easily seen on coronary angiography. The disease usually begins at a point of injury to the inner lining of the arterial wall. As a result, there is a progressive lesion where plaque is formed and is deposited within the endothelium. Continued deposits of plaques can cause the lumen to spasm and thrombus. An obstruction eventually develops in the vessel resulting in diminished blood flow to the coronary arteries causing chest pain or discomfort. The vascular endothelium is the cellular layer lining the blood vessel.

A dysfunction in this layer plays a significant role in the pathological process of the disease. As a result of this dysfunction, there is decreased production of vasodilators such as nitric oxide and increased production of the potent vasoconstrictors such as endothelin and thromboxane (Edwards, 2012, p. 575). The net result is vessel occlusion and diminished blood flow to the coronary arteries leading to the clinical presentation of ischemic chest pains and eventually myocardial infarction.

Significance

The literature provides substantive insights into the pathophysiological differences that exist between men and women with myocardial infarction. It is now known from postmortem studies that women manifest coronary plaque erosion and distal embolization (Gulati & Bairey Merz, 2012, p. 144). The evidence indicates the presence of small artery disease that is manifested in retinal artery occlusion that is found in women with heart disease (Gulati & Bairey Merz, 2012, p. 144). The data indicates that the typical cardiac risk factors including increased lipids, diabetes and HTN greatly compromise endothelial response after menopause and endothelial dysfunction contributes to MI in women (Gulati & Bairey Merz, 2012, p. 144).

Implications

The relevance of the pathological process is of vital significance to health professionals in number of ways.

First, the knowledge gleaned from the research must be utilized to achieve the primary objective of health promotion and disease prevention in area of myocardial infarction in women.

This requires initiating a robust health education and screening aimed at the reducing the conspicuous modifiable risk factor such as hypertension, dyslipidemia and diabetes that remains very crucial to disease prevention and treatment outcome (Edwards, 2012, p. 577; Worrall-Carter et al, 2011, p.533).

Furthermore, critical attention must be given to the unique risk factors such as alterations in hormones after menopause, and endothelial functional capacity. The research data has revealed that these factors contribute more to understanding the disease process than the previous established factors.

Implications

This, coupled with continued investigation, will further enhance the understanding of the pathophysiology of myocardial infarction and eventually lead to early detection, diagnosis and better prognosis in women (Edwards, 2012, p. 577). Skillful and knowledgeable care plays a significant role in decreasing morbidity and mortality in myocardial infarction, the advance practice nurse with a clear understanding of the pathophysiological process can really impact the outcome of those affected with MI.

Conclusions

Numerous studies have revealed that the pathological processes of CHD in women does not follow the previously established pattern of the disease. It was generally accepted that myocardial infarction was considered as a disease characterized by the presence of lesions in the surface of the arteries of the heart.

However, research studies have proven otherwise. It is now understood that women who undergo coronary angiography studies for chest pains usually shows no evidence of obstructive disease (Edwards, 2012, p. 575).

The pathophysiological differences have been attributed to a combination of varying factors. Some of the plausibly factors include endothelial dysfunction, hormonal changes after menopause, higher incidence of modifiable risk factors for the disease. The evidence points out that the majority of the risk factors are modifiable which is vital to disease prevention and treatment.

Additionally, there is the need for gender-specific education for health professionals as well as increased awareness among women. Last but not the least, the data advocates for more gender-specific and clinical programs geared towards a comprehensive methodology in myocardial studies in women. This is essential to understanding the unique symptom presentation in women.

The research outcome demonstrate gender-specific and sex differences in other to eliminate the obstacles that have kept women out. More research is needed in this area to improve the quality of life and health outcomes for women (Wassail-Carter et al, 2011, p.533; Mieres et al, 2011, p.1266).

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