Myocardial Infarction in Young Women
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I have nothing to disclose.
Acknowledgments

- Glenna Swiniarski- Summer studentship
- Dr. Louise Pilote- PI GENESIS Praxy study and the GENESIS investigators
An integrative review- What have we learned in the last 5 years???
Outline

• Aim
• Methods
• Findings
• Results
• Impact on Women’s Health
• Conclusion
• GENESIS
• References
Aim

The purpose of this study was to review the literature on the symptoms specific to young women suffering from MI.
Why is this important?

- 16,000 women < 55 years of age die from CHD each year making it one of the leading causes of death in this group.
- CHD mortality has been increasing in women aged 35-44 while decreasing in all other age groups.
- Young women are under represented in this research with few studies taking into account the influences both age and sex in MI presentation.
Methods

Inclusion Criteria
- Related to MI in young women
- Published within the last 5 years

Exclusion Criteria
- Research not in English
Search for Relevant Studies

Search Words (MEDLINE)

- Women
- Gender
- Young Adult
- Young People
- Myocardial Infarction
- Acute Coronary Syndrome
- Symptoms
- Presentations
- Prodromal Symptoms
- Acute Symptoms
Findings

187 Results

• Abstracts reviewed (full text if needed)
• Exclusion based on inclusion/exclusion criteria
• Repeat articles excluded

6 Relevant articles

• 11 additional articles obtained as relevant references

19 total

• Examining MI differences between sexes, across different ages, and in the young female population
Sample Sites
Sample Sites

- Studies set in:
  - USA [5, 8, 12, 13]
  - Sweden [14]
  - Pakistan [1]
  - Spain [15]
  - Switzerland [16]
  - Serbia [2]
  - Gulf region of the Middle East [17]
  - 2 countries [9, 10]
  - 14 countries [11]
Sample Sites

- Single site [1]
- 15-93 sites [2, 5, 11, 15-17]
- 1057 sites [12] Champney et al 2009
- Database use [10, 13, 14]
- Secondary analysis of nine previous studies [9]
Sample Size

• 195-281 participants [1, 14, 16]
• 1,073-8,176 participants [5, 9, 13, 15, 17],
• 12,094-361,429 participants [2, 10-12]
• The largest had 1,143,513 participants [8]
Research Design

All studies utilized nonexperimental designs

• 5 were retrospective [1, 10, 12-14]
• 4 were prospective [2, 15-17]
• 2 were observational studies [8, 11]
• 5 were review articles [3, 4, 6, 18, 19]
• 1 was a study design [7]
Results

1. Age and MI symptoms
   - 5 articles [1, 4, 15-17]

2. Gender and MI symptoms
   - 10 articles [2, 3, 5, 6, 9, 11, 13, 14, 18, 19]

3. Age and gender in MI
   - Age and gender in MI: 4 articles [7, 8, 10, 12]
1. Age and MI

• 10% of annual MIs occur in adults under 45 years of age
• Young patients differ from older patients in clinical presentation, treatment and outcome of MI
1. Age and MI

Young Adults
• More likely to:
  – Have chest pain
  – Be smokers with a family history of CHD
  – STEMI
  – Have a lower mortality rate

Older Adults
• More likely to:
  – Have dyspnea and signs of heart failure
  – Have had a previous MI
  – NSTEMI
  – Be treated less aggressively
2. Gender and MI

- Chest pain is the most common symptom in MI regardless of gender.
- Women are less likely than men to present with chest pain and more likely to experience atypical symptoms.
- Younger women presenting without chest pain had greater hospital care fatality than men.
- Studies identifying the most common atypical symptoms women experience have produced inconsistent results.
### Women’s Atypical Symptoms

<table>
<thead>
<tr>
<th>Berg et al. [14]:</th>
<th>Coventry et al [18]:</th>
<th>Gopalakrishnan et al. [6]:</th>
<th>Dey et al. [11]:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Nausea</td>
<td>- Fatigue</td>
<td>- Fatigue</td>
<td>- Jaw pain</td>
</tr>
<tr>
<td>- Back pain</td>
<td>- Neck pain</td>
<td>- Mid-back pain</td>
<td>- Nausea</td>
</tr>
<tr>
<td>- Dizziness</td>
<td>- Syncope</td>
<td>- Nausea</td>
<td>- Vomiting</td>
</tr>
<tr>
<td>- Palpitations</td>
<td>- Nausea</td>
<td>- Dyspnea</td>
<td></td>
</tr>
<tr>
<td>- Greater amount of symptoms</td>
<td>- Right arm pain</td>
<td>- Palpitations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Dizziness</td>
<td>- Indigestion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Jaw pain</td>
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</tbody>
</table>
3. Age and Gender

• Young women:
  – Present less often with chest pain
  – Have more atypical symptoms such as tachycardia and hypotension [12]
  – Have more preadmission comorbidites and CV risk factors
  – Have higher mortality rates than young men
3. Age and Gender

• Women were:
  – Less likely to have an ECG than similarly aged men
  – Less likely to receive aggressive pharmacologic treatment
  – Less likely to undergo diagnostic testing for chest pain
  – More likely to wait longer to go to the hospital
3. Age and Gender

These factors prevent the timely diagnosis and treatment of MI resulting in poor health outcomes in the young female population.
Importance of Age and Gender

Studies show that the differences in mortality rate and sex specific differences in MI presentation without chest pain are attenuated, and can reverse, with advancing age. (Older women more similar in presentation, treatment to older men)
Gender Bias

• YOUNG Women have been considered a low risk group due to estrogens capability of protecting against MI up until the age of approximately 75 [8, 10]
• Less than 20% of physicians were aware that CVD was the number one cause of death in women [19]
• Atypical symptoms, being female, and being young in age, are strong predictors of a missed diagnosis of MI and related to poor health outcomes [3, 4]
Impacts on Women’s Health

The unknown manifestation of atypical symptoms in young women predisposes them to delayed recognition, poor health outcomes, and increased mortality.
GENESIS

• What is GENESIS?
• Gender and Sex Determinants of Cardiovascular Disease: From Bench to Beyond (GENESIS)
• GENESIS is funded by the Canadian Institutes of Health Research (CIHR) and the Heart and Stroke Foundation of Canada.
GENESIS- PRAXY (Premature Acute Coronary SYndrome)

Prospective observational study that started January 2009.

- Identify the gender and sex related determinants of presentation, process of care and outcome in premature ACS. Unlike sex, or the “unchanging biology of being male or female”, gender has a wider scope, incorporating “the social roles and expectations attributed to men and women”.

- Consecutive patients aged less than 55 years admitted to urban, tertiary care and community hospitals were enrolled with a diagnosis of ACS
  - Diagnosis of ACS was based on the presence of clinical symptoms, cardiac biomarkers or ECG changes and the presence of chest pain was not a requirement for diagnosis. Atypical presentation of ACS was defined as absence of chest pain symptoms or chest pain of low intensity.

STAY TUNED
Conclusion

• Research examining young women’s presentation of MI is not consistent
• Young women experience more atypical symptoms however these symptoms continue to need to be well defined
• Future research must identify the characteristics of these symptoms to improve the recognition of MI and subsequently improve health outcomes in this group
Thank-You
References


References


