

Sex Differences in Health Services Utilization and Symptomatology before the First Acute Myocardial Infarction

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Patients with acute myocardial infarction (AMI) may experience nonspecific prodromal symptoms in the weeks to months prior to their cardiac event. These include shortness of breath, fatigue, anxiety, and gastrointestinal disturbances, as well as chest discomfort.¹⁻³ Although there is some evidence showing that both women and men experience nontraditional prodromal symptoms,⁴ women may experience different symptoms from men.¹⁻³ Still, less is known about younger women and men with a first AMI.

Our objective was to estimate whether there are sex differences in health services utilization and reasons for seeking care in young patients with a first AMI.

Methods

A retrospective observational cohort study was performed. We used the administrative databases MedEcho and Régie de l'assurance maladie du Québec (RAMQ) in the province of Québec. All patients who (1) were 20–50 years of age and (2) had a first AMI (a most responsible diagnosis of AMI) between April 1, 2000, and March 31, 2004, were included in the study.

Data on hospitalizations, emergency room visits, and family physician visits 1 year before their AMI were analyzed to determine whether or not there was a difference in health care utilization based on sex. Presentations for medical attention in the month prior to the event were also assessed (Table 1). Categorical variables are presented as percentages, and comparisons were evaluated using chi-square tests.

Results

In the examined 4-year period (2000–2004), a total of 48,802 AMIs were identified in the province of Quebec. In total, 6,315 (12.9%) patients

were between 20 and 50 years of age and comprised our study population. There were 1,144 women (mean age \pm standard deviation: 43.9 ± 4.5 years) and 5,171 men (43.7 ± 4.8 years). The ratio of women to men was approximately 1:5. With regard to comorbidities, a higher proportion of women were identified with a history of hypertension, diabetes, and chronic obstructive pulmonary disease before their AMI (all had $p < .0001$; Table 2)

For both sexes, chest pain was the commonest reason for consultation before the AMI. However, abdominal pain, anxiety, depression, and diabetes were more common health problems in women, while lipid abnormalities was a more common cause for men to seek care (Table 3).

In the year before the AMI, 5,275 (83.5%) patients sought care and 2,072 (39.3%) were diagnosed with some form of vascular disease; of those, 1,232 patients (19.5%) were identified with ischemic heart disease (IHD). Only 33% of those patients underwent diagnostic tests or interventions before having an AMI. These included treadmill tests, echocardiography (including stress echocardiography), coronary angiography, sestamibi/thallium heart scan, percutaneous coronary angioplasty, and coronary artery bypass grafting. There was no difference in diagnostic tests or procedures between sexes. The pattern was similar in the month prior to the AMI; 2,891 patients (45.8%) sought medical care and 1,183 (40.9%) were diagnosed with some form of vascular disease; of those, 914 patients (77.3%) were identified with IHD. Only 132 patients (14.4%) underwent diagnostic tests or interventions in the month before the AMI.

Discussion

In this large population-based analysis, we found that 92% of the

Table 1. Health Services Utilization within the Year and the Month before First AMI

Health Services Utilization	1 Year before AMI			1 Month before AMI		
	Women (n = 1,144)	Men (n = 5,171)	p Value	Women (n = 1,144)	Men (n = 5,171)	p Value
≥ 1 hospital admission (%)	16	9	<.0001	4	1	<.0001
≥ 1 emergency room visit (%)	53	45	<.0001	33	28	.0009
≥ 1 family physician visit (%)	89	73	<.0001	45	27	<.0001
≥ 1 of any of the above (%)	92	82	<.0001	59	43	<.0001

AMI = acute myocardial infarction.

Table 2. Selective Characteristics of Women and Men with a First Acute Myocardial Infarction

	Women (n = 1,144)	Men (n = 5,171)	p Value
Mean age in years (SD)	43.9 (4.48)	43.7 (4.76)	NS
Comorbidities			
Hypertension (%)	25	19	<.0001
Diabetes (%)	19	11	<.0001
COPD (%)	11	5	<.0001

COPD = chronic obstructive pulmonary disease; NS = not significant; SD = standard deviation.

women and 82% of the men with a first AMI sought medical care in the year prior to the AMI. Regarding traditional risk factors, hypertension and diabetes were more frequent in women, while an abnormal lipid profile was a more common reason for men to visit a physician.

Chest pain was the most common reason for visiting the health care system in the year and the month before the AMI (20–26%), with no difference between the two sexes. However, women sought care more often than men in the year and in the month before their first AMI. Atypical symptomatology (including anxiety, abdominal pain, and depression) was also more likely present in women.

Furthermore, we documented that, even in the 19.5% of patients diagnosed with IHD in the year prior to the index event, AMI was not prevented. We also noted that although these young patients had known IHD, only one third underwent diagnostic tests or interventions in the year prior to the AMI. This finding has important public health implications. In our study, we did not identify any difference in the performance of diagnostic tests or procedures between women and men with known IHD. However, existing literature supports that women with suspected heart disease are less likely to receive indicated diagnostic tests and procedures compared with men, while sex-based biases in the treatment of myocardial infarction have also been noted.^{5,6} An accumulating body of literature suggests that acute coronary syndrome is underdiagnosed, undertreated, and under-researched in women^{5,6} and points to three major explanations: sex-based physiology, provider bias, and psychosocial influences.⁷

In line with this evidence, it has been suggested that the presence of prodromal symptoms may be underestimated in women; this might be

more common in young ages as an AMI is not “expected” in young women. In several studies^{8,9} involving women and men with cardiac symptoms, it was reported that physicians were less likely to diagnose heart disease in women and refer them for treatment. Arber et al.⁸ offered the explanation of “gendered ageism” to elucidate their finding that compared with men and older women; middle-aged women were asked the fewest questions and prescribed the fewest cardiac medications.

The presence of prodromal symptoms before an AMI has been mentioned in the literature as early as in 1937. In early studies, fatigue and pain were identified as precursors to AMI. However, in these studies sex-specific data were not available. More recently, it has been suggested that a large proportion of women do experience prodromal symptoms before their AMI and that women may have different symptoms from those experienced by men. In a survey of 914 consecutive patients admitted to a coronary care unit with suspected AMI, it was reported that 70% of women and 58% of men experienced nonspecific symptoms in the week prior to admission.¹ In a smaller survey including women with AMI (n = 40), 92.5% experienced at least one prodromal symptom, with 87.5% actually reporting three or more symptoms; most of the women had been experiencing symptoms for 4–6 months.¹⁰ A validated, telephone-administered instrument developed by McSweeney et al. was used in women (n = 515) several months after their AMI.¹¹ The most common prodromal symptoms identified in a number of studies were fatigue, sleep disturbances, dyspnea, indigestion, and anxiety.^{2,3,11} It is interesting that 78% of the patients experienced at least one prodromal symptom daily or several times per week in the 1 month prior to the AMI.²

Our study has several limitations. First, we used health services utilization as a proxy of prodromal symptoms; therefore, we have underestimated the prevalence of prodromal symptoms in this population – we only captured those patients who sought medical attention for these symptoms (not self-reported). Second, we do not know what percentage of patients eventually experienced an AMI (among those who had prodromal symptoms). Third, our study is based on administrative data. While these data have the advantage of capturing the entire population with AMIs in the province of Quebec, they do not contain the level of clinical detail included in registries or in clinical trials.

Table 3. Reason for Seeking Care within the Year and the Month before the AMI

Reasons for Seeking Care	1 Year before AMI			1 Month before AMI		
	Women (n = 1,144)	Men (n = 5,171)	p Value	Women (n = 1,144)	Men (n = 5,171)	p Value
Chest pain (%)	22	20	NS	23	26	NS
Anxiety (%)	14	8	<.0001	3	3	NS
Diabetes (%)	13	7	<.0001	5	3	.0015
Abdominal pain (%)	12	6	<.0001	4	3	NS
Depression (%)	8	4	<.0001	2	2	NS
Lipid disturbances (%)	4	8	.0003	1	2	NS

AMI = acute myocardial infarction; NS = not significant.

This work aimed at exploring the hypothesis that there are differences in the prodromal symptoms of AMI between women and men using population-based data. It provides some evidence that differences between women and men exist, and supports the relevance of sex-specific prospective studies to identify differences in health care utilization and prodromal symptoms between women and men. The evidence that will be generated from these prospective studies will stimulate medical professionals to consider AMI in their differential diagnosis in the presence of specific prodromal symptoms, not only in young men but also in young women, despite the “wrong age” and the “wrong sex.” Also, this evidence will educate patients to be more aware and careful when they experience prodromal symptoms and seek medical attention without delay. The identification of sex-specific prodromal symptoms and the proper interpretation may represent an opportunity to initiate timely cardiac investigation. This is very important as the clinical, psychosocial, and economic impacts of AMI, especially at a young age, are enormous for both women and men.

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Perspectives in GIM

Learning General Internal Medicine in Hospitals

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Multiple changes in the health care system are significantly affecting the training experience in the inpatient setting. Patients are sicker. The interdisciplinary team is an increasingly common model of care. And the spectrum of patients seen in the General Internal Medicine Teaching Unit may be limited depending on the number of subspecialty inpatient services. An unfortunate reality in our present-day hospital system is that a large number of patients are awaiting transfer to a more appropriate care setting.

Challenges we face include an increasing number of learners; variable background knowledge, skills, and attitudes of learners and teachers; trainee contractual and other commitments shortening exposure times to patients in the inpatient setting; changing patient and family expectations; increasingly complex patient problems; pressure to shorten hospital stays; and changing nursing education and experience.

The Royal College Specific Standards of Accreditation for Internal Medicine describe a structure for a clinical teaching unit (CTU) but do