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A Survey of Female-Specific Cardiovascular Protocols in Emergency

Departments in Canada

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Abstract**Background**

Cardiovascular diseases (CVD) remain the leading cause of death for women. However, systematic inequalities exist in how women experience clinical cardiovascular (CV) policies, programs and initiatives.

Methods

In collaboration with the Heart and Stroke Foundation of Canada (HSFC), a question regarding female-specific CV protocols in an emergency department (ED), inpatient or ambulatory care area of a healthcare site was sent via email to 450 healthcare sites in Canada. Contacts at these sites were established through the larger initiative, the 'Heart Failure Resources and Services Inventory', conducted by the HSFC.

Results

Responses were received from 282 healthcare sites, with three sites confirming the use of a component of a female-specific CV protocol in the ED. Three sites noted using sex-specific troponin levels in the diagnosis of acute coronary syndromes, two of which are participants in the CODE MI trial. Therefore, one site reported the integration of a female-specific CV protocol component into routine use.

Conclusions

We have identified that there is an absence of female-specific CVD protocols in EDs that may be associated with the identified poorer outcomes in women impacted by CVD. Female-specific CV protocols may serve to increase equity and ensure women with CV concerns have access to the appropriate care in a timely manner, thereby helping mitigate some of the current adverse effects experienced by women who present to Canadian EDs with CV symptoms.

Keywords: Women, Cardiovascular Health, Heart Health, Sex, Gender

Introduction

Inequities persist in women's cardiovascular (CV) care and treatment. Failing to recognize sex and gender differences in the presentation of CV events may account for the fact that cardiovascular disease (CVD) is on the rise and is the leading cause of death for women worldwide ¹. The long-standing view of CVD as a man's disease has manifested as a lack of awareness of CVD risk in women, which is reflected in clinical care, research, health policies and programs ².

The Canadian Women's Heart Health Alliance (CWHHA), ATLAS Chapter 3- 'Patient Perspectives' identified that women experiencing CV-related health issues presenting at emergency departments (ED) felt 'misunderstood, misinterpreted, misdiagnosed and mistreated' ³. Women described being "Stopped at the Gate" when presenting with symptoms that differed from 'the male experience'. The variation of unusual symptoms makes it difficult for women and clinicians to identify them as CV-related ⁴⁻⁶. While professional associations endorse the use of guidelines for the diagnosis and treatment of CVD in women, this is not reflected in clinical practice ⁷. A focus group of ED nurses identified that if a woman does not "specifically report 'chest PAIN' at ED triage", the 'chest pain protocol' is not activated. One action item to "Open the Gate" to equitable CV care included establishing sex and gender-specific protocols for women presenting to the ED that address known differences in risk factors and 'female-specific' presentation of symptomatology ³.

Currently, there is no consensus on what a 'female-specific' CV protocol should include. There are Nurse-led ED triage protocols/algorithms for patients with acute non-traumatic localized **chest pain** that include: history taking, physical exam,

measurement of cardiac biomarkers and a rapid 12-lead ECG within 10 minutes of arrival to the ER. While chest pain is the predominant symptom reported by women diagnosed with acute coronary syndrome¹¹, women also present with associated symptoms, including nausea, vomiting, shortness of breath, palpitations and pain or discomfort in the jaw, neck, arms or between the shoulder blades⁹⁻¹¹. Furthermore, investigations into the narrative used by females in the ED nursing triage record indicate that females are more likely to use alternative words for pain, including throat discomfort, pressure, tightness, heaviness, squeezing, and/or painful breathing.

Building upon the CWHHA recommendations, we sought to identify if Canadian EDs are using female-specific CV protocols, including female-specific high-sensitivity cardiac troponin (hs-cTn) cut-points, risk assessment and/or reporting of additional signs or symptoms as part of their patient assessment. Therefore, the aim of this study was to survey the use of female-specific CV protocols in Canadian EDs.

Methods

The purpose of the Heart and Stroke Foundation of Canada's (HSFC) larger Heart Failure Resources and Services Inventory¹² (HF RaSI) initiative was to gather comprehensive information on all resources and services available to people with heart failure within adult/pediatric acute care hospitals, general hospitals, and all urgent care hospitals in Canada. This included services across all departments, including the ED, diagnostic imaging, interventional services, in/ out-patient care, and ambulatory care. The information gathered from the HF RaSI was synthesized to inform strategy and action through a collaborative approach involving the HSFC and its many partners and stakeholders.

The HF RaSI contact list was created through a master list of hospitals from prior HSFC RaSI quality initiatives and validated by provincial system leaders. A multi-pronged approach was taken to identify site contacts (sources used included HSFC provincial leads, provincial government leads, and clinical volunteers). The remaining sites were contacted directly and provided guidance to the most appropriate person to contact regarding the HF RaSI. The job titles of survey respondents varied and included: Department Manager, Assistant Manager, Director, Clinical Nurse Educator, Program/Clinic Lead, Nurse, Chief Nursing Executive, Chief Nursing Officer, Clinical Educator, Patient Care Coordinator, Physician, Program Coordinator, VP of Clinical Services and Administrator.

In collaboration with the HF RaSI initiative, we added the following question:

Does your site have any female specific cardiac algorithms/pathways/protocols (e.g., chest pain/discomfort protocol)?

a. In the emergency department? (Yes/No)

If yes, please describe:

b. In inpatient care areas? Yes/No

If yes, please describe:

c. In ambulatory care areas? Yes/No

If yes, please describe:

The question was sent via email in two batches on September 3 and 24, 2021.

Reminders were sent on September 24, 2021, and October 4, 2021, respectively, and a final reminder was sent on January 27, 2022. Responses were collected from September 3, 2021 until February 28, 2022. For Quebec, the question was provided in French and English. While our question also inquired about inpatient and ambulatory care, the focus of our study was the ED.

To assess whether the sites were urban or rural, a population cut-off of < 30,000 (rural) and $\geq 30,000$ (urban) was used¹³. The sites were then assessed based on the 2021 Canadian census¹⁴. For towns not listed on the census, Google's population estimate was used. To determine if sites had an ED they were cross-referenced against provincial listings of EDs. When this information was unavailable for select rural sites, this was determined by using Google maps, photos and news articles.

Results

Responses were received from 282/450 (63%) sites; see figure 1 for survey administration details. Of the 450 sites contacted, 288 (64%) were rural, and 162 (36%) were urban. Of these 21 (7%) rural and nine (5%) urban sites did not have an ED. Of responding sites (282), 193 (68%) were rural and 89 (32%) were urban, 14 (7%) rural, and four (1.4%) urban sites did not have an ED (Table 1).

Table 2 provides an overview of sites contacted stratified by province. Three sites one in Saskatchewan and two in Ontario (two urban, one rural), reported using sex-specific hs-cTn cut-offs in the ED. One Ontario site reported sex-specific hs-cTn cut-offs but reported that no other changes had been made to policies, protocols or pathways. The Saskatchewan site and the second Ontario site are CODE-MI participants. CODE-MI is a Canada-wide stepped wedge, cluster randomized trial¹⁵, which aims to determine whether a lower female-specific hs-cTn threshold would improve the diagnosis, treatment, and outcomes of women presenting to the ED with symptoms suggestive of myocardial ischemia¹⁶. Therefore, only one Ontario ED reported integrating a female-specific CV protocol component into routine use.

Discussion

Our survey identified only one Canadian ED that has integrated a female-specific assessment pathway into clinical care. These findings may help explain why women report being “Stopped at the Gate” when presenting to an ED.

A significant barrier to creating female-specific CV protocols may lie in the sheer paucity of evidence. As of 2018, two-thirds of clinical CV research remains male-oriented, despite the awareness that women’s hearts are different ¹⁰. CV textbooks and conference programs refer to women as “special populations,” although the global population of men and women are almost equal ¹⁷. Coutinho ¹⁷ notes that by peripheralizing women in guidelines, women’s CV health becomes marginalized. Coutinho also notes that through the centralization of women’s CV health, healthcare centers can disseminate knowledge, develop internal policies, change institutional culture and thereby improve the quality of CV prevention and care for all women.

Healthcare provider awareness of CVD prevalence, identification and management for females remains low ¹⁸⁻²⁰. A first step in women not being “Stopped at the Gate” may include integrating female-specific protocol in EDs, which acknowledges women’s unique CVD symptoms during triage to trigger a chest pain protocol. The 2021 AHA/ACC/AASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain ¹¹ includes female-specific recommendations within the ‘CHEST PAINS’ acronym. This includes 2 Class 1 level B recommendations that note 1) women who present with chest pain are at risk for underdiagnosis, and potential cardiac causes should always be considered, and 2) in women presenting with chest pain, it is recommended to obtain a history that emphasizes accompanying symptoms

that are more common in women with ACS. The authors also provide an ‘Index of Suspicion That Chest “Pain” Is Ischemic in Origin’ and a table of ‘Chest Pain Characteristics and Corresponding Causes’ identifying descriptors and symptoms which may assist in identifying CVD in women, leading to more women being diagnosed and treated appropriately¹¹. Finally, women may use different words to describe their chest pain, such as pressure, tightness and/or discomfort and report subtle signs such as shortness of breath, weakness or unusual fatigue¹⁰. It is reasonable to suggest that female-specific CV protocols in EDs would lead to increased awareness amongst the public and healthcare providers. The results of this survey suggest that there is much work to be done in order to ‘Open the Gate’ to equitable CV care for women in Canada. This may start with establishing sex and gender-specific ED clinical protocols for women.

Limitations

The COVID-19 pandemic may have impacted the response rate and the ability of healthcare sites to participate. While the HF RaSI initiative target was 629 Canadian acute care sites, our question was included after the HSFC staff had determined that 179 sites requested no further contact. Therefore, our question included the sites that had already responded to the initial HF RaSI request and/or were being contacted for the first time. The province of Alberta did not participate in the HF RaSI survey. The HFSC provided nine Alberta contacts. Therefore, not all of Alberta was captured in this survey. In the 37% of non-responders, it is unclear whether these sites use female-specific CV protocols in their EDs. There is also reason to suggest that the responses reported may have been associated with the job titles of those who responded. Finally,

not all sites from the HSFC contact list had an ED and, therefore, may not have responded.

Conclusion

Our survey identified only one Canadian ED that has integrated a female-specific assessment pathway into clinical care. The identified paucity of female-specific CV protocols sets the stage for the implementation and evaluation of potential Quality Improvement initiatives. Female-specific CV protocols in Canadian EDs may increase clinician awareness of female-specific sex and gender factors associated with CVD presentation and diagnosis. More importantly, it may begin to ‘Open the Gate’ to women’s clinical CV care and may help mitigate the deleterious effects of women being under-diagnosed and under-treated for CVD in Canada.

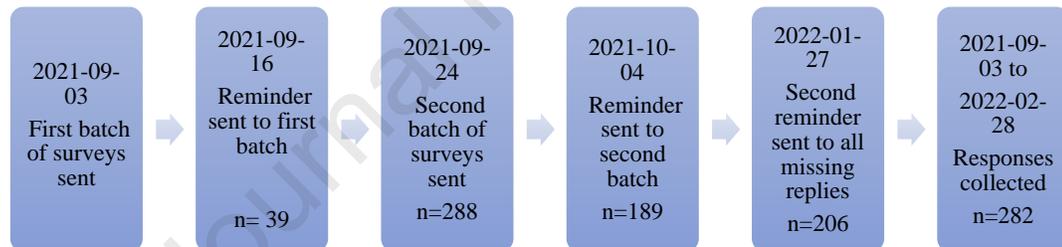


Figure 1. Flow Diagram of Survey Administration Details

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Disclosures

The authors have no conflicts of interest to declare

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Table 1
Responses/Non-Responses Stratified by Province/Territory and Rural/Urban Status

Province	Response	No Response
Alberta	9 ED Urban	
British Columbia	18 ED Urban 34 Rural (28 ED/ 6 No ED)	4 ED Urban 6 ED Rural
Saskatchewan	6 ED Urban 25 Rural (21 ED / 4 NO ED)	2 ED Urban 7 ED Rural
Manitoba	7 Urban (5 ED/ 2 No ED) 41 ED Rural	1 (NO ED Urban 3 RURAL (2 ED/ 1 No ED)
Ontario	45 Urban (43 ED / 2 No ED) 52 Rural (51 ED/ 1 No ED)	17 Urban (14 ED/ 3 No ED) 14 ED Rural
Quebec	1 ED Urban 3 Rural (2 ED/ 1 No ED)	49 Urban (48 ED/ 1 No ED) 51 Rural (45 ED / 6 No ED)
New Brunswick	1 ED Rural	
Nova Scotia	2 ED Urban 23 ED Rural	10 ED Rural
Prince Edward Island	1 ED Urban 5 Rural (3 ED/2 No ED)	
Newfoundland & Labrador	5 ED Rural	2 ED Rural
Northern Territories	2 ED Rural	
Yukon	1 ED Rural	2 ED Rural
Nunavut	1 ED Rural	
Total (450)	282 Response 193 Rural (179 ED/14 No ED) 89 Urban (85 ED/ 4 No ED)	168 No Response 95 Rural (88 ED/ 7 No ED) 73 Urban (68 ED/ 5 No ED)

Table 2
Distribution of Survey Data by Province

Province (# of EDs)	Response Received/ Number Sent	Female-Specific ED Protocol Identified	Code MI sites
Alberta (100)	9/9 (100%)	0	
British Columbia (108)	52/62 (84%)	0	
Saskatchewan (43)	31/40 (78%)	1	1
Manitoba (29)	48/52 (92%)	0	
Ontario (160)	97/128 (76%)	2	1
Quebec (115)	4/104 (4%)	0	
New Brunswick (12)	1/1 (100%)	0	
Nova Scotia (38)	25/35 (71%)	0	
Prince Edward Island (4)	6/6 (100%)	0	
Newfoundland & Labrador (13)	5/7 (71%)	0	
Northern Territories (2)	2/2 (100%)	0	
Yukon (3)	1/3 (33%)	0	
Nunavut (1)	1/1 (100%)	0	
Total (628)	282/450 (63%)	3	2