Heart, Lung and Circulation (2017) xx, 1–9
1443-9506/04/$36.00
http://dx.doi.org/10.1016/j.hlc.2017.01.003

ORIGINAL ARTICLE

Differences in Presentation, Management and Outcomes in Women and Men Presenting to an Emergency Department With Possible Cardiac Chest Pain

Lorcan Ruane, BSc [a], Jaimi H Greenslade, PhD [a,b,c], William Parsonage, DM [a,b,d], Tracey Hawkins, Grad Cert (Nurs) [c], Christopher Hammett, MBChB [c,d], Carolyn SP Lam, PhD [e,f], Thomas Knowlman, BSc [a], Shaela Doig, MBBS [a], Louise Cullen, MBBS, FACEM, PhD [a,b,c*]

[a]School of Medicine, University of Queensland, Brisbane, Qld, Australia
[b]School of Public Health, Queensland University of Technology, Brisbane, Qld, Australia
[c]Department of Emergency Medicine, Royal Brisbane and Women's Hospital, Brisbane, Qld, Australia
[d]Department of Cardiology, Royal Brisbane and Women's Hospital, Brisbane, Qld, Australia
[e]National Heart Centre Singapore, Singapore
[f]Duke-National University of Singapore, Singapore

Received 7 August 2016; received in revised form 7 November 2016; accepted 7 January 2017; online published-ahead-of-print xxx

Background Research suggests that female patients with acute coronary syndrome (ACS) experience delays in emergency department (ED) management and are less likely to receive guideline-based treatments and referrals for follow-up testing. Women are often found to have poorer clinical outcomes in comparison to men. This study aimed to assess current sex differences in the presentation, management and outcomes of patients with undifferentiated chest pain presenting to a tertiary ED.

Methods Data were analysed from two prospective studies conducted at a single Australian site between 2007 and 2014. Eligible patients were those of 18 years of age or older presenting with at least five minutes of chest pain or other symptoms for which the treating physician planned to investigate for possible ACS. Presenting symptoms, ED time measures, follow-up testing and outcomes, including 30-day ACS and mortality, were measured and compared between male and female patients.

Results Of 2349 (60% men) patients presenting with chest pain, 153 men and 51 women were diagnosed with ACS within 30 days . Presenting symptoms were similar in men and women with confirmed ACS. Time from symptom onset to ED presentation, time spent in the ED and total time in hospital were similar between the sexes. Male and female patients had similar rates of follow-up provocative testing. After adjustment for clinical factors, the odds of undergoing angiography were 1.8 (95% CI: 1.36–2.40) times higher for men than women. Of those undergoing coronary angiography within 30 days, a smaller proportion of women, compared to men, received revascularisation. Within 30 days, three (0.2%) male and one (0.1%) female patient died.

*Corresponding author at: Department of Emergency Medicine, Royal Brisbane and Women's Hospital Butterfield Street, Herston, Queensland 4029, Australia. Phone: +61 7 3646 7901; fax: +61 7 3646 1643., Email: louise.cullen@health.qld.gov.au

Please cite this article in press as: Ruane L, et al. Differences in Presentation, Management and Outcomes in Women and Men Presenting to an Emergency Department With Possible Cardiac Chest Pain. Heart, Lung and Circulation (2017), http://dx.doi.org/10.1016/j.hlc.2017.01.003

Conclusion Minimal sex differences were observed in the contemporary emergency management of patients presenting with suspected ACS. 30-day outcomes were similarly low in men and women despite lower rates of coronary angiography and revascularisation in women. Further research is required to replicate these results in different hospital systems and cultural settings.

Keywords Chest pain • Emergency • Acute coronary syndrome • Sex

Introduction

Ischaemic heart disease is the leading cause of death in Australia [1]. Gender disparities [2] in management of patients presenting to the emergency department (ED) with possible acute coronary syndrome (ACS) exist, with reported delays for women from symptom onset to ED presentation [3–11], to first electrocardiogram (ECG) [10,11] and to revascularisation [12–14]. These issues have been linked to the higher rates of mortality that have been described in women after an ACS when compared with men [15–19].

Significant advances in the assessment and management of all patients with possible ACS have occurred, including the use of more sensitive troponin assays, improved ED assessment protocols and improved reperfusion strategies. It is unclear whether the management and outcomes for women with possible ACS have improved since these developments. Similar mortality rates between male and female ACS patients have been observed in some recent studies [20,21], however, contradictory findings exist [22].

The study of ED patients presenting with symptoms of possible ACS in the contemporary era may improve our understanding of sex-specific differences in assessment and management. We compared the presentation, management and outcomes in ED patients with symptoms of possible ACS and investigated sex-specific differences between male and female patients.

Material and Methods

Study Design

Data from two prospective studies on patients presenting to the ED with potential ACS were analysed. The first was a prospective observational study of 983 patients presenting to the ED of an Australian tertiary care hospital between November 2007 and January 2011. The second was a non-randomised interventional trial of 1366 individuals recruited at the same site between February 2011 and March 2014. The intervention was an accelerated protocol in which a subgroup of low risk patients underwent two-hour rather than six-hour troponin testing (described further below). This intervention did not change patient care during the first two hours in the ED and no sex specific protocols were included as part of the intervention. The study protocols were approved by the institutions' Human Research and Ethics Committees (Approval no's. HREC/10/QRBW/403 and HREC2008/101) and complied with the Declaration of Helsinki. Informed consent was obtained from all participants.

Study Recruitment

Both studies followed the same patient recruitment process with the same inclusion and exclusion criteria. Eligible patients were those aged 18 years or older who presented to the ED with at least five minutes of chest pain suggestive of ACS. Using the American Heart Association case definitions, pain suggestive of acute coronary syndrome included acute chest, epigastric, neck, jaw, or arm pain, or discomfort or pressure without an apparent non-cardiac source. Exclusion criteria were as follows: there was a clear non–ACS cause for their symptoms, they were unwilling or unable to provide informed consent (e.g. language barrier), staff considered that recruitment was inappropriate (e.g. terminal illness), they were transferred from another hospital, they were pregnant, they were recruited to the study within the previous 45 days, or they were unable or unwilling to be contacted after discharge. Perceived high risk was not a reason for exclusion.

Data Collection

Eligible patients were recruited during working hours (8am to 5pm) and were identified by research staff using an ED admissions database. Demographic, medical history and clinical data were collected directly from the patient. For risk factors and prior history, if a patient was unsure of an answer, a response of 'no' was recorded. The same staff also supervised serial ECG testing and blood collection for troponin testing. Troponin was measured using the Beckman Coulter second generation AccuTnI assay (Beckman Coulter, Chaska MN). At 30 days post-presentation, research nurses conducted telephone follow-up and reviewed medical records to obtain data on subsequent cardiac events or investigations performed, including exercise stress testing, stress echocardiography, myocardial perfusion scanning, coronary angiography and revascularisation (either urgent or emergency revascularisation only). Follow-up information provided by participants was confirmed by contact with relevant health care providers and original copies of records were obtained.

Thirty-day outcomes were adjudicated by local cardiologists according to predefined, standardised guidelines, using clinical records, ECG, troponin, and investigation results [23]. The definition of ACS included ST segment elevation myocardial infarction (STEMI), non-ST segment elevation myocardial infarction (NSTEMI) and unstable angina

Please cite this article in press as: Ruane L, et al. Differences in Presentation, Management and Outcomes in Women and Men Presenting to an Emergency Department With Possible Cardiac Chest Pain. Heart, Lung and Circulation (2017), http://dx.doi.org/10.1016/j.hlc.2017.01.003