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Nurse Practitioner Knowledge of Symptoms of Acute Coronary Syndrome

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Abstract

Nurse practitioners (NPs) are well positioned to teach women at risk for acute coronary syndrome (ACS) to recognize symptoms and take appropriate actions should symptoms occur. However, NPs need to be knowledgeable of varied symptom presentations. This feasibility study used case vignettes of women with possible ACS symptoms to assess NP knowledge of differential diagnosis of symptoms and actions the women should take in response to the symptoms. Findings suggest that NPs had higher accuracy in diagnosing and recommending appropriate actions for women who had abrupt onset ACS symptoms as compared to women with slow, evolving, and less typical symptoms.

Background

It is important for patients and providers, such as nurse practitioners (NPs), to recognize symptoms of acute coronary syndrome (ACS) promptly so that timely medical treatment can be administered to reduce mortality and morbidity.^{1–4} Unfortunately women are more likely than men to experience more diverse symptoms of ACS which influences their ability to recognize, interpret, and act on symptoms resulting in treatment delay.^{1–9} Thus, NPs should have the knowledge and skills to teach women who are at risk for ACS to recognize symptoms of heart disease and to take appropriate actions.

Case vignettes have been used with patients to assess knowledge of their condition or to provoke discussion about past or future health-related behavior.^{10–11} For example, case vignettes based on the characteristics of realistic situations have been used to assess care seeking decision-making in rural women who had an ACS event.¹¹ Case vignettes of real or hypothetical situations have also been used to assess provider knowledge to determine accuracy in diagnosis and treatment decisions.^{12–13} Case vignettes offer an advantage over case studies because they model clinical practice. Case vignettes may be developed from the

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literature or from real clinical cases, depending on the topic being studied. Once developed, they may be delivered electronically or in-person or by telephone (interview format).

The purpose of this feasibility study was to pilot the use of case vignettes of women with possible ACS symptoms to assess NP knowledge of differential diagnosis and appropriate care-seeking actions in response to the symptoms. The case vignettes were based on real women's stories obtained from grounded theory research¹⁴ which was representative of type of symptoms experiences that have been published in the literature. While the vignettes have been used in prior studies to assess knowledge of women with ACS, they have not been used to assess provider knowledge.

Method

A cross-sectional descriptive design was used to solicit data from NPs who volunteered to participate in the study. Approval from the university IRB was obtained prior to conducting the study. Six case vignettes of women with possible ACS symptoms were presented individually face-to-face through a slide presentation on a laptop computer to a convenience sample of NPs attending the American Association of Nurse Practitioners meeting in June 2017. Participants were asked to determine the diagnosis, whether the situation was "serious", and what action(s) the women should take. Responses with rationale were recorded by the researcher on a case report form. At the end of the data collection participants were provided correct answers with a brochure from the American Heart Association (AHA) outlining ACS symptoms and appropriate actions for patients to take. Total time for participation was ~45 minutes. No incentive was provided for participation consistent with conference guidelines for data collection.

Sample

Twelve female NPs participated in the study. All had graduate level education (nine had an MSN as their highest degree; two had a DNP; and one had a PhD). The mean age of participants was 50.5 years (*SD* 10.9). The mean number of years of experience as a RN was 24.9 (*SD* 11.2) and 12.2 years as an NP (*SD* 6.5). Nine participants were Caucasian, two African-American, and the remaining Pacific Island/Hawaiian descent. All twelve were of non-Hispanic ethnicity. Participants were from varied geographic locations (south/southeast [*n*=5], north/northeast [*n*=4], and southwest/midwest/west [*n*=3]). Practice settings included cardiology/academic (*n*=4), primary care/family practice/outpatient setting (*n*=3), long-term care (*n*=1), and non-cardiology specialty settings (*n*=4).

Main Results

The results in this brief report relate to the five of the six case vignettes that were based on women who had experienced an ACS event. The remaining "negative" case was a woman who had a viral infection which ultimately led to pneumonia.

Cases with Symptoms of Abrupt Onset—In two of the cases (cases one and four), similar characteristics included an abrupt onset of symptoms, featuring "classic" symptoms of a heart attack (chest pain or pressure) with moderate to severe pain intensity referred to in the literature as *immediately recognizable MI* cases.^{7,14–15} In case one, the 75-year-old

female awoke from sleep with chest pressure rated as a “5–6” on a 0–10 pain intensity scale. While most NPs ($n=11$) diagnosed the patient correctly and said the situation was serious, only nine (75%) selected all the correct actions (wake spouse, call 9–1–1, take aspirin). Case four included a woman with sudden onset of sweating and pain in the left arm, jaw, and neck rated as a “5–6” on the pain intensity scale. As with case one, although most of the NPs ($n=11$) chose the correct cardiac diagnosis and said it was serious ($n=10$), only six NPs selected the correct actions to take.

Evolving/Abrupt Conversion MI Cases—Symptom characteristics of case 2 and 6 included slow, evolving, less classic, symptoms that later converted to more severe symptoms that woke up the patient. For case two, eleven NPs (91.7%) identified a cardiac diagnosis and rated the situation as serious. Nine NPs (75%) determined the correct actions. Similarly, case six started as an evolving case with less “typical” symptoms, primarily respiratory in nature. Initially eight NPs said the patient should call (or visit) their primary care provider. However, as the case evolved (symptoms moved into the chest), most NPs (91.7%) got actions correct.

Slow evolving MI—Case three featured a female with a *slow evolving MI* who had intermittent, subtle, less intense symptoms. Fewer participants got the diagnosis, the level of seriousness, or actions correct. Once the case evolved and symptoms lasted much longer, all NPs correctly identified the cardiac diagnosis and the level of seriousness. Yet, five NPs (41.7%) selected the wrong mode of transportation to the ED (private vehicle by spouse versus calling 9–1–1). See Table 1 for the summary of participant responses.

Discussion

These results indicate that NPs had higher accuracy in diagnosing and recommending appropriate care-seeking actions in cases with more abrupt onset “classic” heart symptoms versus cases with less intense evolving symptoms. For the abrupt onset cases, although many NPs indicated the cases were serious, not all felt it was necessary to call 9–1–1. A common response was to have the spouse drive the woman to the ED.

The use of case vignettes of women with possible ACS symptoms were delivered for the first time to practicing NPs to assess their knowledge of ACS symptom presentations and appropriate actions. Our results indicate that delivery of these case vignettes was feasible for use with NPs. As with any vignette delivered for the first time, assessment of unanticipated consequences should be done. Although we anticipated delivery to take ~15 minutes, the total time needed was ~45 minutes per NP. Furthermore, participants suggested using an electronic format in the future with fixed responses to choose from.

A limitation of the study was the small sample size. Thus, a larger full-scale study with an adequate sample powered to detect differences in types of symptom presentations is needed to validate the knowledge of the broader NP group. However, these findings are promising that the use of the case vignettes was feasible for delivery. Furthermore, these findings provide insight into developmental needs for future educational programs for NPs. In addition to highlighting less common ACS symptom presentations in women, educational

programs need to emphasize recommendations from the AHA that adults with symptoms of suspected ACS should call 9–1–1 within 5 minutes of symptom onset, regardless of the intensity of symptoms.

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Highlights:

- Case vignettes are used to assess provider knowledge of diagnosis/treatment of medical conditions
- NPs were more accurate with diagnosis/treatment of cases with abrupt onset classic heart symptoms
- Despite accurately diagnosing ACS cases, some NPs did not believe it was necessary to call 9–1–1.
- Education should highlight less common ACS symptoms in women and appropriate care-seeking actions
- Adults with symptoms of suspected ACS should call 9–1–1 within 5 minutes of symptom onset.

Table 1:**Participant Responses**

Type of Case	Diagnosis Correct	Seriousness Correct	Actions Correct
Abrupt onset, classic sx, moderate-severe intensity.	<u>Case 1</u> : 11 of 12 (91.7%) <u>Case 4</u> : 11 of 12 (91.7%)	<u>Case 1</u> : 11 of 12 (91.7%) <u>Case 4</u> : 10 of 12 (83.3%)	<u>Case 1</u> : 9 of 12 (75%) *Two did not have them call 911 or go to ED at all <u>Case 4</u> : 6 of 12 (50%) *Two said call 911 only if sx lasted longer than 30 min or if pain increased
Slow evolving vague sxs that later converted to be more intense classic sxs that woke the pt up	<u>Case 2</u> : 12 of 12 (100%) <u>Case 6</u> : 7 of 12 (58.3%) initially; 9 of 12 (75%) later as case evolved	<u>Case 2</u> : 11 of 12 (91.7%) <u>Case 6</u> : 10 of 12 (83.3%) initially; 12 of 12 (100%) later as case evolved	<u>Case 2</u> : 9 of 12 (75%) *three had spouse drive them based on driving distance or due to intensity or duration of sx <u>Case 6</u> : 4 of 12 (33.5% initially); 11 of 12 (91.7%) later as case evolved
Slow, evolving, intermittent sxs; less classic but intense	<u>Case 3</u> : 7 of 12 (58.3%) initially, 12 of 12 (100%) later as case evolved	<u>Case 3</u> : 8 of 12 (66.7%) initially, 12 of 12 (100%) later as case evolved	<u>Case 3</u> : 3 of 12 (25%) initially, 7 of 12 (58.3%) later as case evolved *Five said to have spouse drive them based on short distance or due to intensity or duration of sx

Legend: Emergency department = ED; Patient=pt; Symptoms= sx;