Effect of Education on a Chest Pain Mnemonic on Door-to-ECG Time

Authors: Nancy Ballard, MSN, RN, Annette Bairan, PhD, APRN, BC, FNP, Lorene Newberry, MS, RN, CEN,† Lewis Van Brackle, PhD, and Gwen Barnett, BSN, RN, Atlanta, Kennesaw, and Marietta, GA

CE Earn Up to 9 CE Hours. See page 300.

Introduction: Acute myocardial infarction (AMI) continues to contribute to both death and disability in both men and women. The first step in early intervention is an ECG. Atypically presenting patients, especially those who present by self-transport, are more likely to experience delays. The purpose of this study was to evaluate the effect of a new chest pain mnemonic (CPM) as a teaching tool for rapid recognition of AMI patients arriving by self-transport in ED triage in an effort to improve door-to-ECG (DTE) time.

Methods: This study is a longitudinal, quasi-experimental quantitative study. Instruction and evaluation of nurses' knowledge related to identification of AMI before and after instruction on the CPM education (intervention) were coordinated by the emergency clinical nurse specialist. The study sample for the educational intervention included 26 nurses (15% of total population) from 4 emergency departments. Ad hoc queries of the National Registry for Myocardial Infarction database for patients arriving by self-transport to the emergency department were done to examine DTE before and after intervention. The pretests and post-tests of the nurses were analyzed with a paired *t* test, and the pre- and post-intervention DTE times were analyzed by log-linear modeling.

Results: Evaluation of nurses' knowledge before and after CPM education indicated an improvement in DTE time, although it was not statistically significant. There was a significant improvement in DTE time for 2 hospitals that was somewhat negated in the aggregate data. There was a noted trend that showed an advantage in DTE time associated with male patients.

Discussion: Inclusion of tools such as the CPM in education programs for emergency nurses improved rapid recognition of AMI patients presenting via self-transport to the emergency department. Attention to gender differences in patient presentation should be included in future CPM education, and tools to assist nurses in the early recognition of AMI need to be developed. Investigation regarding intra-hospital differences is warranted.

Key words: Chest pain; Mnemonic; Door-to-ECG

Myocardial infarction continues to contribute to both death and disability in both men and women. Salvage of myocardium was based on the use of thrombolytics in the 1970s, and more recently, primary percutaneous coronary intervention has become the gold standard for early presenters to emergency departments with acute myocardial infarction (AMI). Restoration of blood flow in a timely manner can limit the amount of actual muscle damage, leading to the often-heard phrase "time is muscle." The first step of this therapy is an ECG. It has been reported that patients especially presenting to emergency departments by self-transport rather than ambulance are more likely to experience delays in this first step of treatment.[1-3] Typically, these patients present with less dramatic or atypical symptoms, with women experiencing more of a delay than men.[4] Recognition of atypically presenting patients who arrive to emergency departments by self-transport is the responsibility of the triage nurse. No research studies were found that addressed education or support tools for the triage nurse as an intervention to

Nancy Ballard is Coordinator, Center for Nursing Excellence, WellStar Health System, Atlanta, GA.

Annette Bairan is Professor, Kennesaw State University, Kennesaw, GA.

Lorene Newberry, CNS Emergency Services, WellStar Health System, Marietta, GA.†

Lewis Van Brackle is Professor of Statistics, Kennesaw State University, Kennesaw, GA.

Gwen Barnett, Staff Nurse, Emergency Department WellStar Kennestone, Marietta, GA.

†Deceased.

For correspondence, write: Nancy Ballard, MSN, RN, Center for Nursing Excellence, WellStar Health System, 2000 S Park Pl, Atlanta, GA 30339; E-mail: nancy.ballard@wellstar.org.

J Emerg Nurs 2011;37:220-4.

Available online 9 April 2010.

0099-1767/$36.00

doi: 10.1016/j.jen.2010.02.018

TABLE 1
CPM

Letter	Trigger word	Assessment
C	Commenced when?	When did the pain start? Was onset associated with anything specific? Exertion? Activity? Emotional upset?
H	History/risk factors	Do you have a history of heart disease? Is there a primary relative (parent/sibling) with early onset and/or early death related to heart disease? Other risk factors, eg, diabetes, smoking, hypertension, and obesity?
E	Extra symptoms?	What else are you feeling with the pain? Are you nervous? Sweating? Is your heart racing? Are you short of breath? Do you feel nauseated? Dizzy? Weak?
S	Stays/radiates	Does the pain stay in one place? Does it radiate or go anywhere else in the body? Where?
T	Timing	How long does the pain last? How long has this episode lasted? How many minutes? Is the pain continuous or does it come and go? When did it become continuous?
P	Place	Where is your pain? Check for point tenderness with palpation.
A	Alleviates	What makes the pain better? Rest? Changing position? Deep breathing?
	Aggravates	What makes the pain worse? Exercise? Deep breathing? Changing positions?
I	Intensity	How intense is the pain? Rate the pain from 0 to 10.
N	Nature	Describe the pain. (Listen for descriptors such as sharp, stabbing, crushing, dull, burning, elephant sitting on my chest.) Do not suggest descriptors.

Reprinted with permission from Newberry L, Barnett G, Ballard N. A new mnemonic for chest pain assessment. *J Emerg Nurs.* 2005;31(1):84-85.

positively impact rapid recognition of atypically presenting AMI patients.

Mnemonics have been used to improve recall of grouped factors related to care of patients as memory aids. One mnemonic, PQRST—provokes/palliates, precipitating factors, quality, region/radiation' severity/associated symptoms, and time/temporal relations—was published in 2001[5] and made one think of the heart but did not cover risk factors. SINODRARA—site, intensity, nature, onset, duration, radiation, associated features, relieving factors, and aggravating factors—was proposed by Cowie, as noted by Newberry et al.[6] More symptoms were highlighted, but they did not intrinsically make you think of the heart. A mnemonic, CHEST PAIN (Table 1), was published by Newberry et al[6] in 2005 that was lengthier but more comprehensive in including atypical symptoms and risk factors in the assessment. Our study evaluated the use the chest pain mnemonic (CPM) as a teaching tool and a triage support tool on door-to-ECG (DTE) times at 4 acute care hospitals in the southeast ranging from 100 to over 600 beds. We hypothesized that intensive education of all emergency nurses on rapid recognition of atypically presenting AMIs would have a positive association with decreased DTE time on patients arriving by self-transport to the emergency department as measured in the AMI database.

Methods

DESIGN AND SETTINGS

This study was a longitudinal pretest–post-test quantitative study of the CPM nursing education (intervention) and its impact on ED DTE time for cohorts of self-transported patients to 1 of 4 emergency departments, being seen before and after the CPM education. The emergency departments are located in 2 small rural hospitals and 2 large urban hospitals, all of which are community, not-for-profit institutions. One is a tertiary referral center, and all four are part of an integrated health care system.

SAMPLE, INTERVENTION, AND DATA COLLECTION PROCEDURE

All registered nurse (RN) emergency staff from the 4 hospitals received the CPM education as part of an annual skills update. Of these nurses, 26 (15%) volunteered for the study, although 9 months later, only 14 participants returned the post-test because of attrition. The CPM class emphasized recognition of atypically presenting AMI patients, using both presenting complaints and history of risk factors. For message consistency, the CPM was taught at all sites by 1 person, the emergency clinical nurse specialist (CNS). A pretest was given before the class and a post-test was given after the class to determine knowledge related to AMI symptom recognition. The test consisted