Cardiac or Anxiety: A Literature Review of the Young Adult Patient Who Presents to the Emergency Department With Chest Pain

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Patients who present with chest pain are commonly seen in the emergency department. Every day, people who are worried that they may be having a myocardial infarction present to the emergency department. In fact, after abdominal pain, chest pain is the second most common reason to come to the emergency department.[1] The process of establishing the seriousness of symptoms and determining how quickly the patient needs immediate medical treatment is called "triage." Often, triage nurses use an emergency severity index algorithm to assist in determining the seriousness of symptoms. According to the National Center for Health Statistics, in a comparison of data from 2000 with data from 2008, there was a 12.4% decrease in triaged acuity (emergent to immediate) of persons presenting to the emergency department with acute chest pain.[1]

Although specific statistics are not well studied in certain age groups, ED-based practitioners are seeing an increasing number of young adults (aged <40 years) presenting to the emergency department with symptoms of acute chest pain. Many of these young adult patients have no cardiac risk factors. A thorough history obtained from these patients shows that most of them have similar life stressors, restlessness, fatigue, sleep disturbances, and poor dietary patterns. These symptoms typically represent anxiety, also known as a stress reaction.[2] In young adult patients having chest pain as a result of a stress reaction, it is imperative to use best treatment practices in an effort to minimize the cost of unnecessary medical testing and inpatient hospitalization through early outpatient management of these patients.

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The purpose of this article is to provide a synthesis of the literature, assist providers in differentiating between the young adult with acute chest pain that is cardiac related and the young adult with a stress reaction, and discuss ED treatment of the young adult with a stress reaction.

Need for Evidence

When Americans have chest pain, they often go to the emergency department. In fact, chest pain, listed as the chief complaint, accounts for more than 5 million ED visits annually.[1] Historically, the gold-standard screening for the patient with chest pain in the emergency department is extensive. The ECG, which inspects the electrical pattern of the heart, is normally the first screening test initiated upon arrival. This test is noninvasive and quick. However, the standard screening for chest pain is more comprehensive and includes a chest radiograph to determine whether the size of the heart is normal; this also allows the medical provider to observe the lungs for normalcy. Laboratory blood work including levels of creatine phosphokinase, creatine kinase-myocardial bound (CK-MB), and troponin, known as the cardiac markers or cardiac enzymes, is essential to determine whether there is evidence of cardiac muscle damage that is occurring or has occurred in the time frame specific to the test. This time frame normally begins with an elevated troponin level, which peaks at the 12-hour mark. These 3 areas of the gold-standard screening for chest pain—ECG, blood work, and a chest radiograph—are expensive.

The cost of evaluation of the young adult who received medical attention for chest pain in the emergency department ranged from $165 to $8,464.[3] Patients with chest pain are more likely to arrive by ambulance compared with patients having other symptoms.[1] This ambulance service increased the cost incurred. Once acute myocardial infarction is ruled out as the cause of the patient's chest pain, then the focus changes to testing for and ruling out acute coronary syndrome (ACS). ACS refers to a spectrum of clinical presentations for chest pain including myocardial infarction, as well as unstable angina.[4] Approximately 22.5%

of this low-risk, young adult population with risk factors was further evaluated through an inpatient admission.[5] The cost of admission to rule out ACS is also expensive. Of the young adult patients admitted whom had a cardiologist consult, 40% also had a stress test performed. The cost of the stress testing averaged $1,327. Comprehensive testing and consultations for young adults who present to the emergency department with acute chest pain and are admitted are very expensive.

Emergency providers need to determine the cardiac risk factors that are present when young adults present to the emergency department. The recommended treatment for older patients with chest pain is different from that for patients who are younger than 40 years and for patients with cardiac risk factors. Quick identification and appropriate treatment for this population can allow providers to prevent extensive, costly, invasive screenings as a result of misdiagnosis. In addition, expediting outpatient management and limiting unnecessary admissions in young adult patients will minimize the financial impact on the overall medical system.

Cardiac Risk Factors

Cardiac risk factors for young adult patients who present to the emergency department with acute chest pain must be taken into consideration when one is formulating the differential diagnosis. If the patient has high (cardiac) risk factors like drug use, stimulant use, and family history, the plan of care and treatment differ. Qualitative information obtained during the history is imperative. By asking the correct questions and paying attention to important aspects of the patient's history, a provider should be able to determine what type of pain (cardiac or noncardiac) the patient is having.[7]

One of the most important historical variables is family cardiac history. Familial cardiac events at a young age (<40 years) place the patient (or first-generation offspring) at a higher cardiac risk. Although studies have been completed on specific genes spreading cardiac risk to offspring, learned behaviors such as diet, smoking, and exercises habits are also found to be passed to offspring and significantly affect health.[7]

Age and sex also are cardiac risk factors. In a study completed in Pakistan by Shahid et al,[8] 100 young adult patients who had chest pain were examined and followed up for 30 days. The majority of these patients had some sort of cardiac risk factor based on physical findings. Twenty-four had ACS, 20 had acute myocardial infarction, and 4 had angina. Of the 24 patients with ACS, 22 were male patients, and their mean age was 35 years. The likelihood of having ACS was greatest for men aged between 30 and 40 years.[8] However, in patients in any age group presenting to the emergency department with acute chest pain, this symptom should not be disregarded in the presence of cardiac risk factors and positive physical findings.

Consideration of illegal drug use and stimulants is important in the assessment. Street drugs such as cocaine, Ecstasy, and methamphetamine are all powerful stimulants. These stimulants increase the heart rate and blood pressure.[9] Young adults using street drugs run a higher risk of having myocardial infarctions. The number of methamphetamine-related ED visits remains high despite increases and decreases during the past 15 years. "According to Buxton and Dove,[7] nearly 25 million people worldwide are estimated to have used amphetamine and methamphetamine in the past 12 months.[10] Today, legal forms of amphetamines are found in drugs that treat obesity and attention-deficit disorders.[11] Likewise, energy drinks can be stimulants, and their use should be considered. Energy drinks such as Monster, Red Bull, and 5-Hour Energy and soft drinks such as Mountain Dew increase the heart rate and blood pressure and can result in chest pain.

Knowing the characteristics of the pain should assist in guiding the diagnosis. The pleural cavity contains more than just the heart, so asking questions regarding the features of the chest pain can suggest a cause and can guide subsequent evaluation.[12] Questions regarding the precipitating symptoms, the pain quality, any comorbidities, and any associated symptoms are all important. A list of these questions can be found in Table 1. Interestingly, the pain location is not considered vital information because this can sometimes be vague and nonspecific to cause.[12]

While listening to the answers to the aforementioned questions, clinicians can gain information regarding other risk factors that may put their patient in a high-risk category. Is the patient taking any medications that would increase his or her risk of cardiac problems? One class of medication that can cause the patient to be considered high risk is oral contraceptives. Tanis et al[13] found that any type of oral contraceptive use doubled myocardial infarction risk. Information regarding learned behaviors such as smoking, poor diet, poor sleep pattern, physical inactivity, and increased stressors can also be gathered through the questioning process.

Another high cardiac risk to consider is diabetes. The American Diabetes Association indicates that myocardial infarction and stroke "strike people with diabetes more than twice as often as people without diabetes."[14] For this reason, if the young adult patient presents to the emergency department with chest pain and has diabetes, he or she is considered high risk.