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Takotsubo Cardiomyopathy

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Introduction

Takotsubo cardiomyopathy is a rare, reversible form of cardiomyopathy. First cases of takotsubo cardiomyopathy were described in Japan, twenty years ago (Milinis, & Fisher, 2012). Takotsubo cardiomyopathy is a transient left ventricular dysfunction, typically triggered by severe emotional or physical stress.

Left ventricular ballooning is characteristic of Takotsubo syndrome. Images of this ballooning resemble a takotsubo octopus used in Japan for collecting octopus, thus the term “Takotsubo”. The patient will experience chest pain, dyspnea, and ischemic EKG changes (Andrade, & Stainback, 2014).

Because of this, providers of cardiac care must be aware of “Broken heart syndrome” because severe emotional stress has been implicated as the cause of this cardiomyopathy in “approximately two-thirds of patients” (Abide, & Apperson, 2014, p. 10). Clinical presentation is similar to ST segment elevated M (STEMI). Patients present with symptoms of:

- chest pain, dyspnea, and ischemic ECG changes.

Because of presentation many patients undergo cardiac catheterization; however, instead of blockages contributing to the myocardial ischemia symptoms are often clear, and left ventricular ballooning is observed (Abide, & Apperson, 2014).

Most often this form of cardiomyopathy occurs in postmenopausal women. For this reason evidence suggests a connection with hormonal imbalance.

Although takotsubo cardiomyopathy is not a widely recognized or accepted form of cardiomyopathy the prevalence is increasing in the United States. Because of this, providers of cardiac patients should be aware of this syndrome, and consider Takotsubo cardiomyopathy in the differential diagnosis for acute chest pain.

A 72 year-old Caucasian postmenopausal female, presented to the emergency department with a complaint of sub acute crushing chest pain. Vital signs were:

- Temperature 37.5 °C Dengus Cailus,
- Heart rate 94, systolic blood pressure 174mm, diastolic blood pressure 94, mean arterial pressure 72
- Oxygen saturation 94% on 2 liters/min nasal.

Past was described as “heavy and crushing” pain did not radiate and was not relieved by nitroglycerin. An Electrocardiogram demonstrated ST elevation in precordial leads. 4-6 ST elevation is slightly elevated at 0.04. Although, elevated troponin I level is typically much higher with an estimated peak troponin I level of 2-4 days after peak elevation (Andrade, & Fisher, 2012). Although evidence of myocardial infection (STEMI) the ECG physician made the decision to take a side view, as the patient was immobile transferred to the cardiac catheterization lab. (Byrd, & Horrigan, 2012).

Corynary angiography demonstrated clean vessels with no significant arteriographs. After recovery this patient was transferred to the Progressive Care Unit, for further observation.

During the admission process, the patient reported that her husband of twenty years passed away three days ago. All family, and friends had left, leaving her alone at home for the first time. The patient became tearful while speaking of her husband, and said, “I don’t know how I am going to manage this.”

Patient interview indicated no significant past medical history, she is postmenopausal, and has two healthy grown children. Medications included Vitamin D supplement, and multivitamin/mineral supplement. She denied use of alcohol, tobacco, or illicit drugs. BMI is normal at 25. In addition, this patient reported normal floor function of the left local senior center.

Case Presentation

Takotsubo cardiomyopathy is precipitated by a marked hyperadrenergic state (Andrade, & Stainback, 2014). Although, different stresses may contribute to the transient and reversible apical dysfunction, catecholamine excess is the cause for dysfunction. “Nearly ninety percent of patients diagnosed with Takotsubo cardiomyopathy are postmenopausal women” (Andrade, & Fisher, 2012, p. 300).

In addition, emotional triggers are more commonly seen in women.

Severe mental stress precipitates a surge of catecholamine release. In susceptible individuals, this excess of catecholamines causes increased myocardial perfusion, myocardial injury, and in some cases may impair left ventricular output (Wen, & Long, 2014). Although the basic cause of Takotsubo cardiomyopathy is unclear, strong connection regarding stress on the autonomic nervous system is the usual association. “Activation of alpha-1 adrenoreceptors leads to increased cardiac contractility, while beta-1 adrenoreceptors in the heart are mostly responsible for stress induced alteration of cardiac and vascular tone” (Kazemi, & Kalsch, 2011, p. 186).

When hormones such as adrenaline are released in excess, it activates alpha-1 adrenoreceptors causing myocardial hypercontractility, transient and reversible apical dysfunction, which is reversible, and caused by reduced blood flow (Wen, & Long, 2014).

Additional diagnostic testing included:

- Echo, which demonstrated wall-motion abnormalities such as apical balloonning and hypokinesis
- CT scan confirming no myocardial infarction

Pathophysiology

Takotsubo cardiomyopathy is precipitated by a marked hyperadrenergic state (Andrade, & Stainback, 2014). Although different stresses may contribute to the transient and reversible apical dysfunction, catecholamine excess is the cause for dysfunction. “Nearly ninety percent of patients diagnosed with Takotsubo cardiomyopathy are postmenopausal women” (Andrade, & Fisher, 2012, p. 300).

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Signs & Symptoms

- Acute chest pain after stressful event
- Shortness of breath
- Anxiety
- EKG changes such as ST depression
- Mildly elevatedTroponin I
- Abnormal wall motion and ballooning on echocardiogram
- Cardiovascular collapse

Implications for Nursing Care

Excellent nursing care is vital for recovery from an episode of takotsubo cardiomyopathy. Maintaining a healthy lifestyle, promotes optimal recovery from takotsubo cardiomyopathy (Kazemi, & Kalsch, 2011). Nurses at all levels can participate in recovery by:

- Identifying potential causes of emotional stress
- Diligent reporting of abnormal vital signs and symptoms
- Embracing a multidisciplinary care approach
- Providing education and assisting with coping skills
- Advance planning services may also manage and monitor medication regulation
- Promoting self-empowerment mental health care

Conclusions

Ninety-five percent of patients who experience takotsubo cardiomyopathy will have a recurrence of disease, even after enduring other stressful events. (Sharkley, Lesser, & Maron, 2015)

The case patient was hospitalized for five days. On discharge, her BNP was 105, and troponin 1 was less than 0.125. She had no complaints of chest pain, and was looking forward to going home. Discharge medication included: Furosemide, Metoprolol, and Losartan. Outpatient appointments scheduled included, follow-up with primary care and cardiologist, as well as referral to primary mental health practitioner. Home health services were consulted to assist with monitoring of weight, vital signs, and providing ongoing medication monitoring. In addition, community resources such as grief counseling services, and meal services were provided. Long-term progress suggests no deterioration of heart muscle after a stressful event (Sharkley, Lesser, & Maron, 2013).

References Cited


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