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Takotsubo Cardiomyopathy

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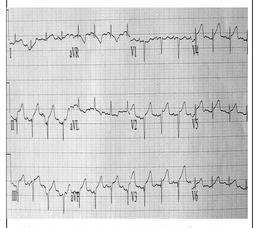
Introduction

- Term Takotsubo was introduced in 1991 to describe the shape of the left ventricle during an episode of cardiomyopathy
- Takotsubo is a Japanese term for a narrow-necked fishing pot used to catch octopus
- The left ventricle assumes the shape of the octopus pot during Takotsubo cardiomyopathy
- Takotsubo cardiomyopathy is commonly known as Broken Heart Syndrome due to its association with an emotional stressor
- Mimics acute coronary syndrome without coronary artery blockage/stenosis
- Affects more women than men
- Occurs mainly in postmenopausal women (women over the age of 50)
- Believe a hormonal effect on catecholamine release plays a role

Presentation of Disease

- Similar to ST elevation myocardial infarction
- Electrocardiogram showing ST elevation
- Elevated total creatinine-kinase lab value (>38-120 ng/mL)
- Elevated Troponin lab value (>0.1 ng/mL)
- Patients do not always have a cardiac history
- Many patients have no risk factors for coronary artery disease



EKG of Takotsubo cardiomyopathy patient showing ST elevation (from Medscape, 2014)

Apical ballooning and the takotsubo

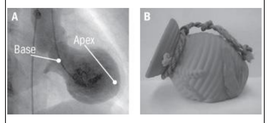
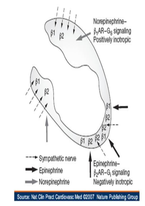


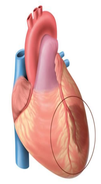
Figure A: Left ventricular ballooning associated with Takotsubo Cardiomyopathy
Figure B: Japanese octopus trap, called a Japanese takotsubo
(from Harvard Women's Health Watch, 2010)

Signs and Symptoms

- Chest pain and/or chest pressure
- Shortness of breath
- Occasional nausea and vomiting
- Can have signs and symptoms of fluid overload
- Hypotension can sometimes occur
- Irregular heart rhythm can occur
- Symptoms treated with oxygen, morphine, aspirin, nitroglycerin, and anticoagulant therapy
- Lack of coronary artery stenosis identified during coronary artery catheterization
- Left ventricular apical ballooning identified
- During coronary artery catheterization: identify hypokinetic apex with narrow and hypercontracted base during systole (ventricular contraction)
- Recent severe, personal stressor suffered by the patient identified

Mechanisms of remote wall motion defects in STEMI : *An Intrinsic Takotsubo effect ?*





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(by S., Venkatesan, 2013, Expressions in Cardiology)

Underlying Pathophysiology and Significance

- Exact mechanism remains unknown
- Excessive catecholamine release due to a stressor is a popular theory
- Sympathetic nervous system stimulates catecholamine (epinephrine and norepinephrine) release
- Catecholamines stimulate beta adrenoreceptors in the heart; causing intracellular calcium overload
- Increased calcium results in cardiac muscle damage
- Catecholamines cause microvascular spams (reducing perfusion and coronary flow reserve)
- End result is left ventricular dysfunction

Treatment

- Mainly supportive
- Similar to myocardial infarction patient
- EKG monitoring during hospitalization
- No evidence-based guidelines for treatment
- Beta blocker administration
- ACE inhibitor administration
- Aspirin administration
- Occasional diuretic use depending on patient's history or current signs and symptoms
- Emotional and stress alleviation
- Learn relaxation techniques and stress relief strategies
- Follow-up with cardiologist
- Outpatient echocardiograms

Implications for Nursing Care

- Close hemodynamic monitoring in the ICU
- Frequent lab draws to monitor electrolyte and cardiac enzyme levels
- Disease education
- Medication education
- Emotional and physical stress alleviation (even though experiencing Takotsubo cardiomyopathy twice in unlikely)
- Establish individualized stress relief strategies
- Enrollment in cardiac rehabilitation

Conclusions

- Still unsure of catecholamines exact effect in Takotsubo cardiomyopathy (several theories have been identified)
- Triggered by an acute emotional stressor; not chronic stress
- Overload of intracellular calcium and/or microvascular spasm due to catecholamine release are the main culprits
- Reversible left ventricular dysfunction
- Recovery occurs within weeks
- Long-term prognosis is excellent if patients have early recognition and prompt treatment

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