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Japanese Octopus Traps & Broken Hearts: Takotsubo Cardiomyopathy

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Introduction

-Takotsubo cardiomyopathy (TTC) is a non- ischemic cardiomyopathy in which there is a "transient left ventricular systolic dysfunction, proposed to be due to apical ballooning syndrome of the left ventricle" which results in an acute MI in the absence of significant epicardial coronary artery disease (Lüscher, Maron & Sharkey, 2011).

-The term originates from the apical ballooning shape, found via left ventriculography or echocardiography, that is similar to a Japanese octopus trap called "takotsubo" (Reeder & Prasad, 2015). Other ballooning shape, found via left ventricular biopsy, "maron ventricle" which results in an apical ballooning ischemic cardiomyopathy in which there is a "transient left ventricular systolic dysfunction, proposed to be due to apical ballooning syndrome of the left ventricle" symptom, stress "takotsubo" (Reeder & Prasad, 2015).

-Both ballooning shapes are due to a transient ischemic injury that causes transient LV dysfunction (Sharkey, T. J., 2011).

Proposed Underlying Patophysiology

-Pathophysiology of TTC may be explained through the increased catecholamines and myocardial ischemia (DeLeon, R. F., 2014).

-Other theories include metabolic, pharmacologic, and myocardial ischemia (Sharkey, T. J., 2011).

-Coronary Artery Vasospasm & Microvascular Dysfunction. Another common hypothesis is that it is caused by coronary artery vasospasm and coronary microvascular dysfunction producing an acute myocardial infarction (Lüscher, Maron & Sharkey, 2011).

Summary of Treatment

-Conservative treatment that mimics myocardial hibernation treatment may be beneficial for TTC (DeLeon, R. F., 2014).

-However, if TTC is likely to develop, treatment may be necessary to reduce LV dysfunction (Selvanayagam, J., 2011).

-If a trigger is identified, education for primary prevention may provide benefits: (Selvanayagam, J., 2011).

-Diagnostic tests & features: TTC usually triggered by a physical or emotional stressor in the patient (Sharkey, T. J., 2011). TTC is usually triggered by a physical or emotional stressor in the patient (Sharkey, T. J., 2011).

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Implications for Nursing Care

Monitoring

-For acute care setting, care for patients with TTC should include close hemodynamic and/or troponin monitoring as shock and malignant arrhythmias are known to occur and are the largest contributors of death (Liang, Cha, Oh & Prasad, 2013).

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References

Machino, C.: Criteria for Takotsubo Cardiomyopathy

1. Transient hypokinesis, akinesia, or dyskinesis of the left ventricular mid-segments with or without apical akinesia; the regional wall motion abnormalities extend beyond a single apical vascular distribution; a stressful trigger is often, but not always, present.

2. Absence of obstructive coronary disease and/or angiographic evidence of acute plaque rupture.

3. Necrobiotic xanthogranulomatous (either ST-segment elevation and/or T-wave inversion) or modest elevation in cardiac troponin.

4. Presence of ACS triggering TK or myocardial ischemia