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Takotsubo Syndrome
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Introduction
Takotsubo syndrome, also known as Takotsubo cardiomyopathy, is a bizarre, often misunderstood, and arguably underdiagnosed, due to the nature of presentation of symptoms and the rarity of its occurrence. Autopsies are unreliable for finding Takotsubo cardiomyopathy, making it hard to know how many people die from it more often than known cases (Angelis, 2018). Takotsubo cardiomyopathy was originally discovered in Japan in the 1990s. The term for “takotsubo trap” is Takotsubo, which is the shape that the left ventricle resembles when individuals have takotsubo syndrome (Farshad, Sachan, Jakso, & Ababou, 2015).

There are many names for this type of reversible cardiomyopathy, including Stress-induced heart failure, or Broken Heart Syndrome (Galván et al., 2018). These names were chosen due to the fact that Takotsubo syndrome is usually preceded by a psychogenic or physically stressful event in an individual’s life (Mukoh et al., 2019). It is in order that all patients be able to identify the event that also can happen in patients with: pheochromocytoma, chemotherapy, pheochromocytoma, and pheochromocytoma, (Bill et al., 2018). These vasospasms lead to apical ballooning of the left ventricle.

Signs & Symptoms
This can be confusing because Takotsubo Syndrome presents similarly to Acute Coronary Syndrome. This can be problematic because treatment for Takotsubo Syndrome differs from treatment for Acute Coronary Syndrome.

• Chest pain
• Shortness of breath
• Syncope

Usually presented as:
• Those with acute psychological or physical distress (Misumi et al., 2016), hence the name of ‘broken heart syndrome’
• Females (McLean, Sama, & Chew, 2018)
• elderly (Galván et al., 2018)
• postmenopausal (Galván et al., 2018)
• those with neurological or psychiatric disorders (McLean, Sama, & Chew, 2018)
• postoperative patients (Galván et al., 2018)
• including those with recent cancerous resection (Raza, 2015)
• individuals with pheochromocytoma, chemotherapy (Angelis, 2018)
• malignancy (Cammar, 2019).

Underlying Pathophysiology
The underlying pathophysiology is, unfortunately, not fully understood. There is still research being done on this more newly discovered syndrome. There are some ideas for what may be the causes. They are as follows:

• Catecholamine toxicity

Acute catecholamine surges seem to be the primary cause of Takotsubo Cardiomyopathy. Stressful event can trigger an increase in the endocrine system causing the hypothalamus and pituitary gland to release high amounts of catecholamines. The Takotsubo Syndrome is the cardiovascular response (Amaro, et al., 2018).

• Microvascular dysfunction or failure

These vasospasms lead to apical ballooning (Bill et al., 2018). These vasospasms are said to be caused by stressful events (Fahar, Sachan, Jakso, & Ababou, 2019).

• Left Ventricular dysfunction with apical dyskinesis

This causes low ejection fraction and can progress to other cardiac and systemic issues.

In most cases, it appears that the pathological path of Takotsubo Syndrome begins with a stressul trigger that is psychological or physical in nature, leading to high levels of catecholamines, which results in microvascular dysfunction and vasospasms, which, in turn causes left ventricular dysfunction. While this can happen separately, it appears that usually one causes the trickle down of events causing chest pain, dyspnea, and/or syncope.

Implications for Nursing Care

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Diagnosis
Obtaining an accurate history is needed, looking especially at recent psychological or physical stressors.

• Using echocardiogram to assess the left ventricle function of a heart is the updated way to diagnose cardiac events even before there is dysfunction in ejection fraction (Dias, 2018). An echocardiogram will show dyskinesis of the left ventricle with hypercontraction of the basal wall (Galván et al., 2018).

• Cardiac Enzymes are not typically elevated, partially due to the fact that it is non-acute (Galván et al., 2018).

• EKG changes are significant including ST elevation, T-wave changes, a prolonged QT interval (Galván et al., 2018).

• Heart Cath typically shows normal coronary arteries, even though heart function is off.

• Treatment
While catecholamines are the first line treatment for those with Acute Coronary Syndrome, it is incredibly important that catecholamines are NOT used with Takotsubo Syndrome, since high levels of catecholamines can cause Takotsubo Syndrome.

• Ongoing nursing care including emergency administration helps treat symptoms (Angelis, 2018). Intracoronary Nitroglycerin administration helps treat symptoms.

• There is an element of self-healing that seems to work for those with mild dyskinesia of the left ventricle. This can result in clotting, so to prevent strokes, anticoagulation is considered (Santer, 2018).

• Education
The implications for Nurses and Advanced Practice Nurses lays with making sure patients are well educated. If patients meet criteria for being at risk for Takotsubo Syndrome they need to know to call 911 if they have symptoms of this disorder. After surgery, trauma, or severe emotional distress, patients should be educated.

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• Along with patients, other healthcare providers need to be educated on signs and symptoms of Takotsubo Syndrome, and to know the treatment so that patients have the best possible outcome.

Conclusion
Takotsubo cardiomyopathy has many names and many cases. It is not well understood and it is not fully clear how to treat it effectively. While symptoms can be scary and sudden, they tend to subside quickly and, generally, people tend to recover well. There is a risk of death, especially if the patient is not monitored and treated promptly. Understanding the pathophysiology of Takotsubo Syndrome is incredibly important. Advanced Practice Nurses need to make sure that they are comprehensive in their diagnostic interventions, and examination of each patient that presents with typical signs and symptoms. Treatment needs to be quick and patients need to be monitored closely. The Better Advanced Practice Nurses become at understanding Takotsubo Syndrome, the better care patients will receive.

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Underlying Pathophysiology

Significance
The significance of the pathophysiology for Advanced Practice Nurses is important for any disorder. It is extremely imperative for those with Takotsubo Syndrome because understanding the pathophysiology can change whether an individual is treated incorrectly for Acute Coronary Syndrome or, correctly, for Takotsubo Syndrome. A misdiagnosis can mean incorrect treatment and could lead to poor outcomes for patients.

While most people recover from this syndrome, there is still the possibility of death. Other complications include cardiogenic shock, ventricular arrhythmias, left heart failure, left ventricular thrombus, left ventricular wall rupture, and mitral regurgitation (Fahar, Sachan, Jakso, & Ababou, 2019).

Presentation of Case/Processes
A 38-year-old female patient presents with no cardiac history complaining of sudden and severe chest pain. The chest pain is accompanied by shortness of breath. Her only history is depression and hysterectomy 6 weeks prior due to fibroids. Her mother passed away suddenly this week. Upon examination, she is alert and oriented and answering questions appropriately. She has an 8/10 left sided chest pain and has tachycardia. Her vitals are as follows:

- Temperature: 98.3
- Respiratory rate: 32
- Heart rate: 71
- Blood pressure: 132/84
- Oxygen saturation: 96% on room air

The Advanced Practice Nurse orders an EKG which finds that there are ST changes. The patient is sent to ICU to be closely monitored. While in the ICU, the patient has lab work sent. The results are unremarkable with the exception of troponin and CK which are mildly elevated. The Advanced Practice Nurse orders an echocardiogram. The results show that the patient has an ejection fraction of 20% and has left ventricular dysfunction with apical akinesis.

The patient is urgently taken to the Cath lab for cardiac catheterization where normal coronary arteries are noted. The provider administers nitroglycerin into the coronary arteries. When the patient awakens, her pain is relieved. After returning to her room, she is closely monitored and eventually is able to go home.

Her Advanced Practice Nurse explains that she is lucky that she was diagnosed early and that treatment was quickly effective, avoiding ECMO. The patient is placed on oral anticoagulation to prevent stroke and to come back if symptoms re-depict.

She follows up with oral echocardiograms until her ejection fraction is improved to 50%.

Conclusion
Takotsubo cardiomyopathy has many names and many cases. It is not well understood and it is not fully clear how to treat it effectively. While symptoms can be scary and sudden, they tend to subside quickly and, generally, people tend to recover well. There is a risk of death, especially if the patient is not monitored and treated promptly. Understanding the pathophysiology of Takotsubo Syndrome is incredibly important. Advanced Practice Nurses need to make sure that they are comprehensive in their diagnostic interventions, and examination of each patient that presents with typical signs and symptoms. Treatment needs to be quick and patients need to be monitored closely. The Better Advanced Practice Nurses become at understanding Takotsubo Syndrome, the better care patients will receive.