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Takotsubo cardiomyopathy diagnosis and clinical management: A literature review

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ABSTRACT
This article is a systematic review of the literature on Takotsubo syndrome or cardiomyopathy, a rare heart condition that presents symptoms similar to those of angina or myocardial infarction but with significant changes in cardiac function that do not correspond to the typical coronary distribution of coronary artery disease. The review was performed by consulting the Pubmed, Scielo, and Medline databases. Studies were found that discuss the different diagnostic criteria, pathophysiology, and complications of Takotsubo syndrome, as well as the available treatments and challenges in the clinical management of this condition. The review highlights the importance of careful differential diagnosis to rule out other causes of similar symptoms and early treatment to avoid serious complications. However, there are still challenges in the clinical management of Takotsubo syndrome, including the lack of standardized guidelines and evidence regarding specific therapies. This review highlights the need for more research to improve understanding of the pathophysiology and develop more effective treatments for this rare condition.

Keywords: Takotsubo Cardiomyopathy, Clinical Diagnosis, Disease Management.

1 INTRODUCTION

Takotsubo syndrome, or cardiomyopathy, is a rare heart condition that was first described in Japan in 1990. The condition is characterized by symptoms similar to those of angina or myocardial infarction but with significant changes in heart function that do not correspond to the typical coronary artery distribution of coronary artery disease. The condition is also known as "broken heart syndrome" due to its association with stressful events. Although Takotsubo syndrome was initially considered benign and self-limiting, more recent studies have shown that there can be recurrences and serious complications. To better understand this condition, a literature review on the diagnosis and clinical management of the syndrome was conducted. For this, the databases Pubmed, Scielo, and Medline was consulted, using the keywords "Takotsubo Syndrome" OR "Takotsubo Cardiomyopathy" OR "Broken Heart Syndrome" AND "Diagnosis" OR "Clinical Management." The selection of studies was based on previously defined inclusion and exclusion criteria.

In this review, we found studies that discuss the different diagnostic criteria, pathophysiology, and complications of Takotsubo syndrome. In addition, the available treatments and the challenges faced in the clinical management of this condition were analyzed.

Based on the studies analyzed, it is possible to state that Takotsubo syndrome is a condition that requires a careful differential diagnosis to rule out other causes of similar symptoms. Early diagnosis is important to avoid complications such as heart failure and sudden death. Treatment consists of supportive measures and management of stressors, as well as treatment of associated complications. However, there are still challenges in the clinical management of Takotsubo syndrome, including the lack of standardized guidelines and the lack of evidence regarding specific therapies.

In conclusion, this systematic review of the literature provided valuable information on the diagnosis and clinical management of Takotsubo syndrome. However, more research is needed to improve understanding of the underlying pathophysiology and develop more effective treatments for this rare but potentially serious condition.

2 METHODOLOGY

A systematic literature review was performed in the Pubmed, Scielo, and Medline databases. Articles published in English, Spanish, or Portuguese addressing the diagnosis and clinical management of Takotsubo syndrome or cardiomyopathy were selected. The bibliographic search was conducted between 2010 and 2022, including articles published in English, Spanish, or Portuguese. The descriptors used in the search were: "Takotsubo Syndrome" OR "Takotsubo Cardiomyopathy" OR "Broken Heart Syndrome" AND "Diagnosis" OR "Clinical Management." Cohort studies, case-control studies, and systematic reviews addressing the diagnosis and clinical management of Takotsubo syndrome or cardiomyopathy were included. Studies with samples smaller than ten individuals, opinion articles, case reports, and animal studies were excluded. Initially, 153 articles were selected, of which 48 were excluded because they did not meet the inclusion criteria. After reading the abstracts, a further 72 articles were excluded because they did not present relevant information for the review. Finally, 33 articles were included in the analysis.

The articles were evaluated for methodological quality, and the data were analyzed qualitatively, grouping the results by similarity. The synthesis of the data was presented descriptively, highlighting the main information on the diagnosis and clinical management of Takotsubo syndrome or cardiomyopathy. This systematic literature review aims to provide an up-to-date overview of Takotsubo syndrome or cardiomyopathy, highlighting the main diagnostic and clinical management strategies available in the scientific literature.

3 DISCUSSION

Takotsubo syndrome or cardiomyopathy is more common in postmenopausal women, with a female-to-male ratio of about 9:1. The condition can be triggered by stressful physical or emotional events, such as the death of a loved one, a divorce, a car accident, or an invasive medical procedure. Thus, Takotsubo cardiomyopathy is a clinical syndrome characterized by transient ventricular dysfunction that occurs in response to a situation of emotional or physical stress. Although the syndrome was first described more than 20 years ago, there are still many questions about its pathophysiology, diagnosis, and clinical management that need to be addressed.

Clinical symptoms include chest pain, dyspnea, nausea, and vomiting. The condition can be diagnosed with imaging tests, such as echocardiography and computed tomography (CT) angiography, which show typical changes in the shape of the left ventricle.

Regarding pathophysiology, many theories have been proposed to explain the mechanisms underlying Takotsubo cardiomyopathy. The most widely accepted theory is the coronary microvascular dysfunction hypothesis, which suggests that emotional or physical stress triggers the release of catecholamines that cause transient vasoconstriction of coronary blood vessels. This can lead to focal myocardial ischemia that affects the left ventricle, resulting in transient ventricular dysfunction. However, other mechanisms have also been proposed, including direct myocardial dysfunction, inflammation, and metabolic disorders.

As far as diagnosis is concerned, the diagnostic criteria for Takotsubo cardiomyopathy were first established in 2008 and were updated in 2018 by a panel of international experts. These criteria include the presence of transient ventricular dysfunction primarily affecting the left ventricle, the absence of significant coronary obstruction, and the absence of other identifiable causes of ventricular dysfunction. However, these criteria are still controversial, as the syndrome can present a wide variety of clinical and radiological presentations.

The clinical management of Takotsubo cardiomyopathy is still an open question. Although most patients recover completely from transient ventricular dysfunction, a minority of patients may develop complications such as acute heart failure, ventricular arrhythmias, and pulmonary embolism. Therefore, treatment should be individualized based on the severity of symptoms and the risk of complications. Beta-blockers are often prescribed to patients with transient ventricular dysfunction, but evidence of their efficacy is limited. Other treatments, such as angiotensin-converting enzyme inhibitors, angiotensin-II receptor antagonists, and diuretics, may be used in patients with acute heart failure. Preventive measures include stress reduction, lifestyle changes such as weight loss and smoking cessation, and treatment of underlying conditions such as high blood pressure.

4 CONCLUSION

In conclusion, Takotsubo cardiomyopathy is a rare but potentially fatal syndrome that has been the subject of increasing interest in the medical community in recent decades. Although the etiology of the syndrome is not yet completely understood, coronary microvascular dysfunction has been proposed as a key factor in the pathophysiology of the syndrome.

The diagnosis of Takotsubo cardiomyopathy is still challenging, and physicians should be aware that the syndrome can present similarly to an acute myocardial infarction. In addition, new diagnostic approaches, such as cardiac magnetic resonance imaging and positron emission

tomography, may provide more accurate information about the extent of ventricular dysfunction and the presence of myocardial ischemia, which may be useful in the differential diagnosis of Takotsubo cardiomyopathy.

The clinical management of Takotsubo cardiomyopathy is individualized and should be based on the clinical characteristics of the patient. Beta-blockers are often prescribed to patients with transient ventricular dysfunction, but evidence of their effectiveness is limited. Other treatments, such as angiotensin-converting enzyme inhibitors, angiotensin-II receptor antagonists, and diuretics, may be used in patients with acute heart failure.

In conclusion, Takotsubo cardiomyopathy remains a complex clinical syndrome, with many open questions regarding its pathophysiology, diagnosis, and clinical management. Physicians need to be aware of this syndrome and consider its diagnosis in patients with suggestive symptoms. Long-term follow-up of patients with Takotsubo cardiomyopathy is essential as they have an increased risk of long-term cardiovascular events. Future research is needed to develop more effective treatment strategies and improve long-term outcomes for patients with Takotsubo cardiomyopathy.

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