What Medicare Knows About the Takotsubo Cardiomyopathy*

Scott W. Sharkey, MD

Takotsubo cardiomyopathy (TTC) is a recently recognized, yet incompletely understood form of acute heart failure. Efforts to characterize TTC have been hampered by its relatively low incidence. In this issue of JACC; Heart Failure, Murugiah et al. (1) have examined the United States Medicare dataset to provide a contemporary profile of this enigmatic condition. In this TTC population, Murugiah et al. (1) affirm that >90% are Caucasian women, with 1% to 2% prevalence relative to acute myocardial infarction (AMI), and with outcomes more favorable than AMI. The validity of the findings is strengthened by the number of patients (20,000) and the requirement for coronary angiography (without revascularization) in patients with TTC as a discharge diagnosis. Several aspects of this research warrant comment.

This report illustrates the emergence of TTC as a widely recognized clinical entity within the United States. Although first described in Japan some 25 years ago, TTC remained a curiosity in the United States until early the 2000s (2,3). Following a number of scientific publications (4), TTC was formally classified as a distinct cardiomyopathy by the American Heart Association in March 2006 (5) and subsequently received a unique International Statistical Classification of Diseases, 9th Revision code (429.83) in October 2006. As Murugiah et al. (1) note, the discharge diagnosis of TTC within the US Medicare population increased 3-fold between 2007 and 2012. These findings are consistent with those recently reported from another large US healthcare dataset, the National Inpatient Sample (6), and together provide documentation of the efficiency of information dissemination within the US medical community.

Murugiah et al. (1) recognize that TTC occurs in 2 clinical scenarios, either as a principal event, or as a secondary event in the context of a co-existing major illness. This distinction is relevant, with major differences in patient characteristics and implications for outcome. Patients with TTC as a principal event typically present with chest discomfort, ischemic electrocardiogram changes, and troponin elevation and therefore meet current criteria for diagnosis of AMI. Consequently, these patients can reasonably be assigned a principal discharge diagnosis of either TTC or AMI by hospital coding staff, with the choice perhaps partly driven by economic factors. This diagnostic ambiguity occurs frequently as Murugiah et al. (1) report 58% of patients with TTC as a secondary diagnosis have AMI as the principal diagnosis. This is a significant issue and will need consideration in future studies involving large US datasets because the proportion of patients with TTC as a secondary diagnosis will likely increase with an aging population and increased complexity of hospitalized patients.

This publication provides the most robust information to date regarding TTC outcome among the US Medicare population and demonstrates a survival advantage relative to comparable AMI patients. Murugiah et al. (1) report 1-year survival of 93% in patients with TTC as a principal diagnosis and 89% in patients with TTC as a secondary diagnosis. Whether this prognosis qualifies as “favorable” is debatable since nearly 1 in 10 TTC patients did not survive the

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From the Minneapolis Heart Institute Foundation at Abbott Northwestern Hospital, and the Hypertrophic Cardiomyopathy Center, Minneapolis, Minnesota. Dr. Sharkey has reported that he has no relationships relevant to the contents of this paper to disclose.
first year post-event. Contemporary reports involving unselected TTC patients from Europe and the United States have confirmed in-hospital mortality of 2% to 4%, and 1-year mortality of 10% (7-10) and TTC patients have significantly worse survival when compared to the U.S. general population (7,8). Hospital mortality among TTC patients is often the consequence of a cardiac event such as acute heart failure, cardiogenic shock, cardiac rupture, cardiogenic shock, or cardiac arrest (7-10). In addition, TTC survival is influenced by co-existing life-threatening illnesses which may, in fact, act as TTC triggers. Therefore, TTC is not always a benign and reversible condition and TTC itself could represent a marker for disease severity and overall adverse outcome (11).

Notably, Murugiah et al. (1) include information regarding patients with TTC diagnosis who did not undergo coronary angiography. This is a substantial proportion with 1,352 (14%) of hospitalizations with TTC as principal diagnosis and 14,077 (54%) with TTC as secondary diagnosis. The reasons for not performing coronary angiography are unknown but likely include physician preference, patient age and frailty, and presence of life-threatening comorbid conditions such as terminal malignancy. Although some patients might have undergone computed tomographic coronary angiography, this is likely a small number. Patients with TTC diagnosis without confirmatory invasive coronary angiography have far worse outcomes than those with angiography. In patients with principal diagnosis TTC (with coronary angiography), 1-year mortality was 7% versus 11% for those without angiography. Similarly, for patients with TTC as secondary diagnosis (with coronary angiography), 1-year mortality was 11% versus 25% for those without angiography. This significant difference in mortality, with and without coronary angiography, is unexplained but may reflect the influence of comorbid conditions affecting physician selection of patients for an invasive procedure. Unrecognized and untreated acute coronary artery disease might also impact survival of patients mistakenly diagnosed as TTC. Acute myocardial ischemia or infarction involving the left anterior descending coronary artery can mimic TTC and coronary angiography is necessary to exclude this important scenario (12).

Despite the expanded characterization of TTC nicely conveyed within this report, many uncertainties remain. For example, what explains the striking vulnerability of older women to this condition? Why do TTC patients have better outcomes than AMI patients, yet fare worse than the general population? Why do men have less favorable outcomes than women? What explains the frequent omission of coronary angiography in patients with TTC diagnosis? Why are non-Caucasian races not more broadly represented? Do patients younger than 65 years have different characteristics and outcomes? The creative methods used in the report of Murugiah et al. (1) represent one approach to addressing these questions.

REPRINT REQUESTS AND CORRESPONDENCE: Dr. Scott W. Sharkey, Minneapolis Heart Institute Foundation, 920 East 28th Street, Suite 300, Minneapolis, Minnesota 55407. E-mail: scott.sharkey@allina.com.

REFERENCES


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