Therefore, their excellent work extends the understanding of our findings.

There are no studies, which have confirmed the true mechanism underlying Tako-Tsubo cardiomyopathy, although many interesting reports have been published worldwide. Further investigation, such as a large-scale study in collaboration with many investigators in various countries, is required to confirm that a glucose metabolism disorder in the myocardium may reflect the root cause or a secondary response in patients with Tako-Tsubo cardiomopathy, as well as the true underlying mechanism.

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What do tachycardiomyopathy belong to?

We read with interest the new classification of cardiomyopathies proposed by the European Society of Cardiology (ESC) working group on myocardial and pericardial disease,[1] which certainly represents a praiseworthy step towards a more clinically oriented classification system that overcomes some of the limitations of the recent American Heart Association classification. However, a controversial point concerning both classifications is represented by the inclusion of tachycardiomyopathy (TCMP) in the group of 'primary cardiomyopathies'. The ESC classification define cardiomyopathy as a '. . . myocardial disorder in which *the heart muscle is structurally and functionally abnormal* . . .', excluding pathological myocardial processes and dysfunctions that are a *direct* consequence of other cardiovascular abnormalities such as valvular heart disease, systemic hypertension, and coronary artery disease. According to this definition, TCMP should not be included in the group of primary cardiomyopathies as clinical evidence, and experimental studies clearly demonstrate that myocardial dysfunction is associated with the occurrence and persistence of abnormally increased heart rate in the context of supraventricular and ventricular tachyarrhythmias.[2,3]

Experimental models of TCMP have shown that chronic rapid pacing produces a severe reversible cardiomyopathy sustained by transient functional and structural changes of myocytes including cellular elongation and myofibril misalignment.[4,5] Similarly, in patients, tachyarrhythmias can cause a severe cardiac dysfunction which, however, recovers in the weeks following the termination or rate control of tachyarrhythmias. Accordingly, the diagnosis of TCMP requires the demonstration of left ventricular function improvement after treatment of arrhythmias, thus excluding other mechanisms contributing to cardiac dysfunction.

Indeed, the absence of complete recovery of left ventricular function after termination of tachyarrhythmias suggests the presence of a previously unrecognized underlying myocardial disease made clinically evident by the occurrence of tachyarrhythmias. That may be the case in patients with subclinical forms of idiopathic or inflammatory dilated cardiomyopathy, in which a persistent increase in heart rate may produce clinical symptoms in previously asymptomatic subjects. Of note, concealed cardiomyopathies may represent the substrate of tachyarrhythmias eventually leading to a progressive deterioration of clinical picture and precipitating non-reversible morpho-functional ventricular abnormalities. Although the complex link between electrical properties, mechanical function, and structural integrity of myocardial cells needs further clarification, TCMP, at the present

time, should be excluded from primary cardiomyopathies in the current ESC classification, similarly to what is the case for ion-channel disorders.

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What do tachycardiomyopathy belong to?: reply

We thank Dr Pieroni and colleagues for their response to the position statement from the ESC Working Group on Myocardial and Pericardial Diseases on the classification of cardiomyopathies. The authors' main point is that it is inappropriate to classify left ventricular dysfunction caused by persistent atrial tachyarrhythmia ('tachycardiomyopathy') as a *primary* cardiomyopathy. We agree. One of the major innovations of the ESC classification is the abandonment of the terms primary and secondary because of their arbitrary and inconsistent use in previous classifications.[1] The exclusion of patients with myocardial dysfunction caused by coronary artery disease, hypertension, valve dysfunction, and congenital heart defects from the definition of cardiomyopathy could be criticized as being inconsistent with this philosophy, but it was the consensus view of the Working Group that reclassification of these established diseases as cardiomyopathies would be confusing and unlikely to be adopted in everyday practice. In the new classification system, tachycardiomyopathy is simply a non-familial cause of dilated cardiomyopathy.

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Tilt testing potentiated with sublingual nitroglycerin in children with unexplained syncope

We read with great interest the article by Foglia-Manzillo *et al.*[1] on head-up tilt testing (HUT) with sublingual nitroglycerin in children with unexplained syncope. The authors concluded that nitroglycerin challenge greatly increased the positive rate of passive tilt with a small decrease in specificity. In our early studies with passive HUT, we observed that sensitivities of a test were 60% in children and 26% in adults.[2] However, we noticed that the specificity of HUT in children is lower than in young adults (100 vs. 68%, respectively).[3] 'The Italian Protocol' is generally accepted as an investigation tool of unexplained syncope in adults.[4] The question remains whether we should accept the same doses of nitroglycerin for adults and children (even those <8 years of age). The anthropometric characteristics (weight, height, and body mass index) or/and activity in sports should be factored into clinical investigation. Both body mass index and activity in sports may influence the tilt test results.[5]

Moreover, the optimal testing of a control group would demand longer follow-up to predict potential future syncope in up to 18 years. However, we realize that this may be very difficult in practice. Recently, the paper by Vlahos *et al.*[6] questions the routine use of nitroglycerin in the evaluation