Review

Coronary microvascular dysfunction and idiopathic dilated cardiomyopathy

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Abstract:
There is growing evidence of the presence and relevance of coronary microvascular abnormalities in many cardiac diseases. In particular, it has been recently shown that dilated cardiomyopathy (DCM) is characterized by dysfunction of the coronary microvessels since its very early onset. Coronary microcirculatory dysfunction is not an effect of myocardial damage but seems in turn to cause progressive contractile impairment, ventricular dilation and heart failure. The mechanisms of the progressive deterioration of cardiac function in DCM are largely unknown but both myocardial hypoperfusion and myocardial ischemia at the microvascular level are most probably involved. It has been demonstrated that the presence and the extent of coronary microcirculatory dysfunction in patients with early stage DCM is an independent and relevant predictor of worse prognosis. From these studies it is more and more evident that the coronary microcirculation is involved in the pathogenesis of DCM and should be considered a new target of treatment in those cardiac diseases at risk to evolve towards heart failure.

Key words:
dilated cardiomyopathy, coronary microcirculation, ischemia, heart failure

Introduction

Dilated cardiomyopathy (DCM) is a cardiac muscle disease characterized by reduced contractile function and dilation of the left or both ventricular chambers [32].

Idiopathic DCM is frequent and distinct from specific forms of the disease caused by toxic agents (i.e. alcoholic cardiomyopathy), systemic (i.e. diabetic cardiomyopathy) or other cardiovascular disorders (i.e. ischemic cardiomyopathy) [32]. In the present paper we will mainly refer to “idiopathic” DCM.

The incidence of DCM in Europe is 6.95/100,000 new cases a year [30], but this is a rough estimation since there is a growing evidence that the course of the illness is asymptomatic and difficult to recognize for a long period [31]. DCM is a relevant cause of morbidity for arrhythmia and heart failure and it is diagnosed in about half of heart transplant recipients. Though 20% to 45% of new cases demonstrate functional recovery under appropriate treatment, the prognosis remains severe with an average mortality of 20% at 5 years [9].

Because of the epidemiologic and prognostic relevance of DCM, compared to the lack of definite pathogenetic hypothesis, intensive clinical and experimental research is on going to understand the mechanisms of the disease. DCM is also an important clinical model in which to test new treatments targeted to