PRIMEVIEW

DILATED CARDIOMYOPATHY

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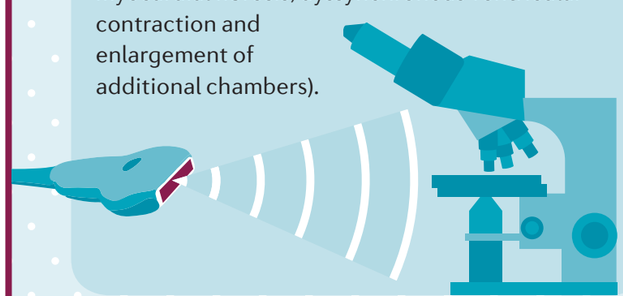
Dilated cardiomyopathy (DCM) is a disease of the myocardium (heart muscle), with structural (dilation of the ventricles) and functional (impaired contractility) abnormalities. DCM can eventually lead to heart failure and life-threatening arrhythmias.

DIAGNOSIS

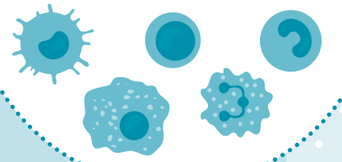
The signs and symptoms of DCM mainly relate to the extent of ventricular systolic dysfunction and can include dyspnoea, fatigue and chest pain. Dilation is assessed with echocardiography, and cardiac MRI can identify the presence of fibrosis and oedema. Individuals with suspected inflammatory DCM should undergo endomyocardial biopsy. Analyses of biopsy samples with histology, immunohistochemstry and molecular biology techiques can determine the type of inflammatory infiltrate and the underlying aetiology, potentially guiding management choices. Factors that can worsen the prognosis include a left ventricular ejection fraction <35% and adverse remodelling characteristics (such as functional mitral valve regurgitation, myocardial fibrosis, dyssynchronous ventricular contraction and enlargement of additional chambers).



PATHOPHYSIOLOGY

INFLAMMATION

The activation of inflammatory pathways and the recruitment of immune cells result in fibrosis and remodelling, which cause dilation



GENETIC MUTATIONS

Up to 30% of DCM cases are caused by mutations in genes encoding proteins of the sarcomere (the basic contractile unit) or desmosome (a cell-to-cell adhesion structure)

AUTOIMMUNITY

Cardiac-specific autoantibodies have been isolated from patients with DCM, and, rarely, some autoimmune diseases (such as systemic lupus erythematosus, systemic sclerosis and rheumatoid arthritis) can cause DCM

ENLARGED VENTRICLES

MANAGEMENT

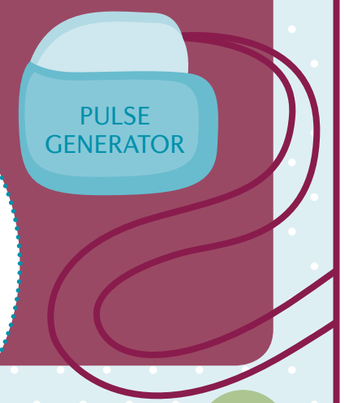
Treatment aims at reducing symptoms of heart failure and improving cardiac function. Several pharmacological options are available, including angiotensin-converting enzyme inhibitors and β-blockers. Cardiac resynchronization therapy with a pacemaker or an implantable cardioverter defibrillator might also be indicated. Additional aetiology-based therapies, such as immunosuppressive and antiviral therapies, might be appropriate in patients with biopsy-confirmed myocarditis or infection, respectively.

INFECTIONS

Myocarditis (inflammation of the myocardium) can be caused by infection with several pathogens, especially viruses

CHEMICAL AND TOXIN EXPOSURE

Long-term abuse of alcohol or cocaine can lead to DCM, which can also occur as an adverse effect of cancer chemotherapeutic agents, such as anthracyclines



Sex hormones alter cardiac function by binding to androgen and oestrogen receptors on cells. Women have higher levels of oestrogen receptors than men, and activation of these receptors prevents cardiomyocyte apoptosis, inhibits oxidative damage and reduces cardiac hypertrophy and fibrosis

EPIDEMIOLOGY

The 2015 Global Burden of Disease study estimated a global prevalence of cardiomyopathy of 2.5 million cases. In a multi-site study in the United States and Canada, DCM was the most common form of cardiomyopathy among children. The relative risk of mortality from DCM is higher in black individuals than in white individuals. DCM occurs more frequently in men than in women, and men also tend to have worse outcomes.

OUTLOOK

Advances in imaging techniques (such as speckle-tracking echocardiography) have the potential to detect systolic dysfunction before DCM develops. New sera biomarkers might not only aid diagnosis and indicate the risk of heart failure but also identify the underlying pathology and thereby help inform treatment. Improving our understanding of the contribution of infection, inflammation and autoimmunity to cardiac damage and remodelling in the pathogenesis of DCM could lead to the development of new therapeutic opportunities.

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