ISSN NO: 2770-2936
January 2025

Cardiomyopathy

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Abstract: Cardiomyopathy is a group of diseases characterized by primary or secondary damage to the heart muscle, leading to impaired mechanical or electrical functions of the heart. This disease occurs in different forms: dilated, hypertrophic, restrictive, and arrhythmogenic right ventricular dysplasia. Cardiomyopathy can be accompanied by heart failure, arrhythmias and thromboembolic complications.
The etiology of the disease may be related to genetic, infectious, toxic, autoimmune or metabolic factors. Clinical symptoms include shortness of breath, fatigue, palpitations, and edema.
Treatment options include medications (ACE-inhibitors, beta-blockers, diuretics), invasive procedures (ICD, CRT, heart transplant), and lifestyle changes. Prevention includes heart health care, risk factor management, and regular checkups.
Early detection and treatment of cardiomyopathy is important in improving the patient's quality of life and reducing complications.
Key words: Cardiomyopathy, Dilated cardiomyopathy (DKMP), Hypertrophic cardiomyopathy (GKMP), Restrictive cardiomyopathy (RKMP), Arrhythmogenic right ventricular dysplasia, Heart muscle damage, Heart failure, Arrhythmia, Thromboembolism, Genetic factors, Diastolic dysfunction, Heart electrical function, Heart transplantation, ACE-inhibitors, Beta-blockers, Shortness of breath, Prevention, Etiology of heart diseases, Mechanical function of the heart.

Cardiomyopathy (CMP) is a group of diseases characterized by primary or secondary damage to the heart muscle, which is manifested by a violation of the mechanical or electrical function of the heart, an increase in its size, a thickening of its walls, or a loss of elasticity.
This condition can lead to the development of heart failure, arrhythmias and thromboembolic complications.
Types of cardiomyopathy:
1. Dilated cardiomyopathy (DKMP) is characterized by enlargement of the left or right ventricle of the heart.
2. Hypertrophic cardiomyopathy (HKMP) is characterized by asymmetric or symmetrical thickening of the heart muscle.
3. Restrictive cardiomyopathy (RKMP) - loss of elasticity of heart muscles, as a result of which diastolic dysfunction develops.
4. Aryphmohemogenous right ventricular dysplasia is characterized by replacement of right ventricular muscles with fibro-fatty tissue.
Etiology:
Primary cardiomyopathy can be idiopathic or due to genetic factors.
Secondary cardiomyopathy is caused by infections, intoxications, autoimmune diseases, metabolic disorders, or other extracardiac causes.
Clinical signs: Shortness of breath, Fatigue on exertion, Swelling of the legs, Rapid heartbeat or arrhythmia, Chest pain
Cardiomyopathy is a primary or secondary damage to the heart muscle, characterized by mechanical or electrical dysfunction of the heart, changes in size, and thickening of the walls.
The main clinical forms of this disease are:
1. Dilated cardiomyopathy (DKMP): It is characterized by dilation of heart ventricles and decrease in contractile function. It often causes heart failure and arrhythmias.
2. Hypertrophic cardiomyopathy (HKMP): Arbitrary thickening of the heart muscle, especially in the wall of the left ventricle. The risk of diastolic dysfunction and cardiac arrest increases.

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3. Restrictive cardiomyopathy (RKMP): As a result of the loss of elasticity of the heart muscles, diastolic filling is disturbed. This form is rare and usually associated with chronic diseases.
4. Arrhythmogenic right ventricular dysplasia (ARVD): It is characterized by replacement of right ventricular muscle tissue with fibro-fatty tissue. Increases susceptibility to arrhythmia.

The most common causes of primary cardiomyopathies

Genetic factors: familial extended CMP, the genetic factor plays the main role in its development, it is observed in 20-30% of all cases of the disease. Exogenous factors: the development of dilated cardiomyopathy as a result of previous infectious myocarditis and infectious (enteroviruses, borrelia, hepatitis C virus, and HIV) effects (in 15% of cases) includes interdependence. After infection caused by coxsackie viruses, heart failure can develop (even after several years).In addition, using molecular hybridization methods, the presence of enterovirus RNA in the nuclear DNA of patients with myocarditis and dilated cardiomyopathy was found. Dilated cardiomyopathy can also occur as a result of the toxic effects of alcohol.

Autoimmune diseases: under the influence of exogenous factors, the proteins of the heart have antigenic properties, support the synthesis of antibodies and cause the development of dilated cardiomyopathy. An increase in the amount of cytokines and the number of activated T-lymphocytes was found in the blood. In addition, antibodies to laminin, myosin heavy chains, and tropomyosin vaccine are detected. Idiopathic restrictive cardiomyopathy includes diseases such as endomyocardial fibrosis and eosinophilic endomyocardial disease (Loeffler's disease).

Secondary restrictive cardiomyopathy includes: hemochromatosis, amyloidosis, sarcoidosis, scleroderma, carcinoid heart disease, glycogenesis, radiation damage to the heart, and drugs (anthracycline intoxication).

HYPERTROPHIC CARDIOMYOPATHY

Hereditary disease caused by mutations in one of four genes encoding cardiac proteins (beta-myosin heavy chains, gene localized on chromosome 14; cardiac troponinT, gene localized on chromosome 1; alpha-tropomyosin, gene localized on chromosome 15, myosin-binding protein C, the gene is located on chromosome 11); At least 6 genetic loci responsible for the disease have been identified, often as a result of the family environment.. It is also assumed that one of the causes of the disease is the occurrence of various mutations in one of the five genes encoding the synthesis of cardiac sarcomere proteins (troponin T, troponin I, alpha-tropomyosin, beta-myosin, myosin-binding protein C). About 70 of these genes cause hypertrophic cardiomyopathy. mutations have been identified.

Prognosis

Experiments show that the course of cardiomyopathy is very unfavorable, as a result of which the following conditions occur: heart failure develops steadily, arrhythmic, thromboembolic complications and sudden death are high. After diagnosis of dilated cardiomyopathy, the 5-year survival rate is 30%. Systemic treatment can improve the condition indefinitely. In cases after heart transplantation, cases of survival of the patient more than 10 years have been observed.Although the surgical treatment of subaortic stenosis in hypertrophic cardiomyopathy has undoubtedly had a positive result, there have been many cases of patient death during or shortly after the operation (every 6th patient dies). Women with cardiomyopathy should avoid pregnancy because of the increased risk of maternal mortality.

Summary

In short, cardiomyopathy is a disease characterized by structural and functional impairment of the heart muscle, which prevents the heart from pumping blood efficiently. It can lead to heart failure, arrhythmias and, in severe cases, life-threatening complications. Depending on the type, treatment options may include medications, lifestyle changes, or surgery. Early detection and proper treatment are important.

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ISSN NO: 2770-2936
January 2025

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