

Difference Between Cardiomyopathy and Congestive Cardiac Failure

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Key Difference - Cardiomyopathy vs Congestive Cardiac Failure

Congestive cardiac failure and cardiomyopathies are two extremely common conditions that are responsible for millions of cases of mortality and morbidity all around the world. Cardiomyopathies are a heterogeneous group of diseases of the myocardium associated with mechanical and/or electrical dysfunction that typically exhibit inappropriate ventricular [hypertrophy](#) or [dilatation](#). They are caused by a variety of factors that frequently are genetic. They are either confined to the heart or are part of generalized multi- system disorders, often leading to [cardiovascular](#) death or progressive cardiac failure related instability. The inability of the heart to pump blood at an adequate rate to meet the metabolic demands of the body is called the congestive cardiac failure. The key difference between cardiomyopathy and congestive cardiac failure is that **congestive cardiac failure is actually a manifestation of the cardiomyopathies whose pathological changes disrupt the normal functioning of the heart.**

What is Cardiomyopathy?

Cardiomyopathies are a heterogeneous group of diseases of the myocardium associated with mechanical and/or electrical dysfunction that usually exhibit inappropriate ventricular hypertrophy or dilatation. They occur due to a variety of causes, typically due to genetics. They are either confined to the heart or are part of generalized multi- system disorders, often leading to cardiovascular death or progressive cardiac failure related instability.

There are three main types of cardiomyopathies:

Dilated Cardiomyopathy

This type of cardiomyopathies is characterized by progressive cardiac dilatation and contractile (systolic) dysfunction, usually with concomitant hypertrophy.

Causes

- Genetic mutations
- [Myocarditis](#)
- Alcohol
- Childbirth
- Iron overload
- Supraphysiological stress

Morphology

The heart is enlarged, flabby and heavy. The presence of mural thrombi is commonly observed. Histologic findings are non-specific.

Clinical Features

- Patients usually suffer from dyspnea, easy fatigability, and poor exertional capacity.

Hypertrophic Cardiomyopathy

This is a genetic disorder characterized by myocardial hypertrophy, poorly compliant left ventricular myocardium, which leads to abnormal diastolic filling and intermittent ventricular outflow obstruction.

Morphology

- Massive myocardial hypertrophy
- Disproportionate thickening of interventricular septum relative to the free wall. This is called asymmetric septal hypertrophy.
- Massive myocyte hypertrophy, irregular arrangement of myocytes and contractile elements in sarcomeres and interstitial fibrosis are the unique microscopic features.

Clinical Features

- Stroke volume is reduced because of the impairment of diastolic filling.
- Atrial fibrillation
- Mural thrombi

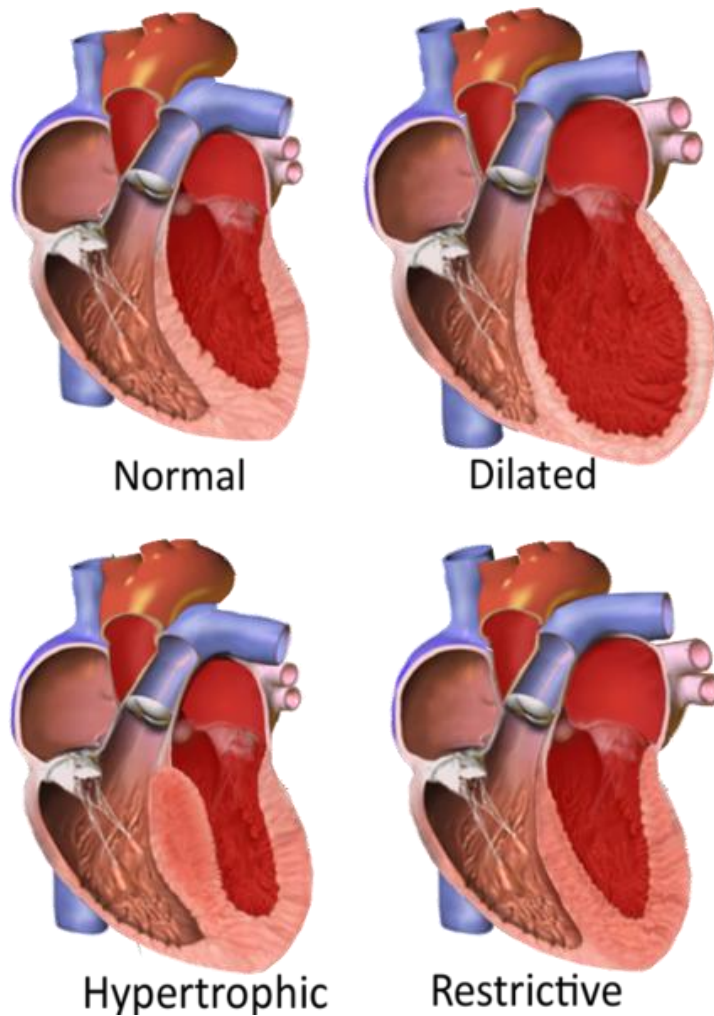


Figure 01: Major types of cardiomyopathy

Restrictive Cardiomyopathy

This is the least common type of cardiomyopathies and is characterized by a primary decrease in ventricular compliance, resulting in impaired ventricular filling during [diastole](#).

Causes

- Radiation fibrosis
- Sarcoidosis
- Amyloidosis
- Metastatic tumors

What is Congestive Cardiac Failure?

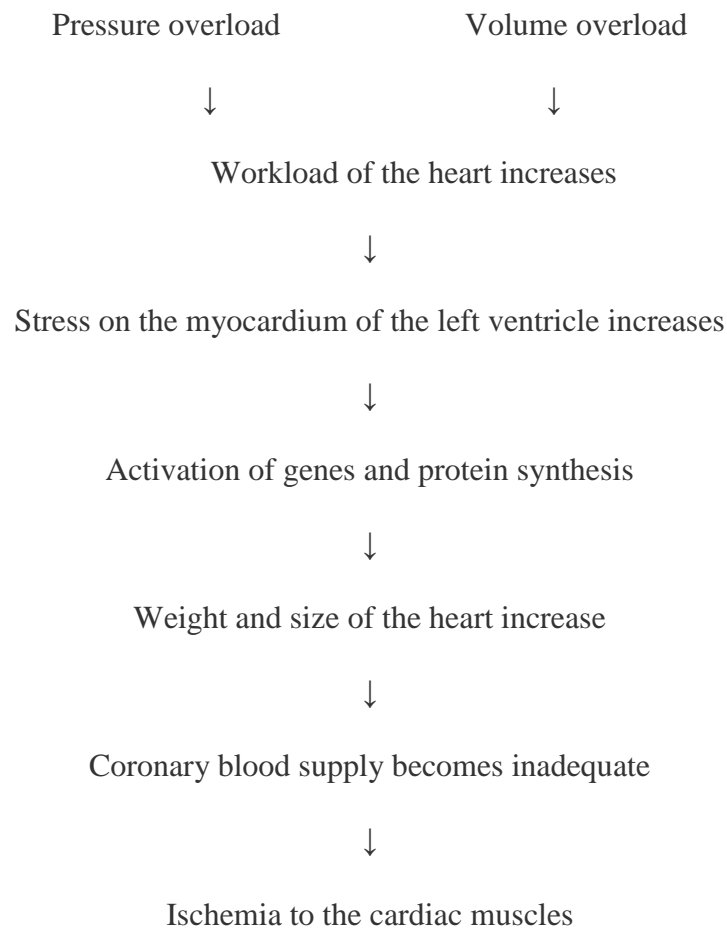
Congestive cardiac failure is the inability of the heart to pump blood at a rate adequate to meet the metabolic demands of the body.

With the progressive deterioration of the cardiac functions, several compensatory mechanisms are elicited in order to compensate for the lack of pumping ability of the heart. These mechanisms are

- Frank -starling mechanism
- Myocardial adaptations such as hypertrophy
- Activation of neurohormonal mechanisms such as the renin- angiotensin aldosterone pathway.

At the end stage disease, these compensatory mechanisms are also overwhelmed, putting the patients into a life -threatening condition.

Pathophysiology





Ischemic death of the cardiac muscles



Cardiac failure

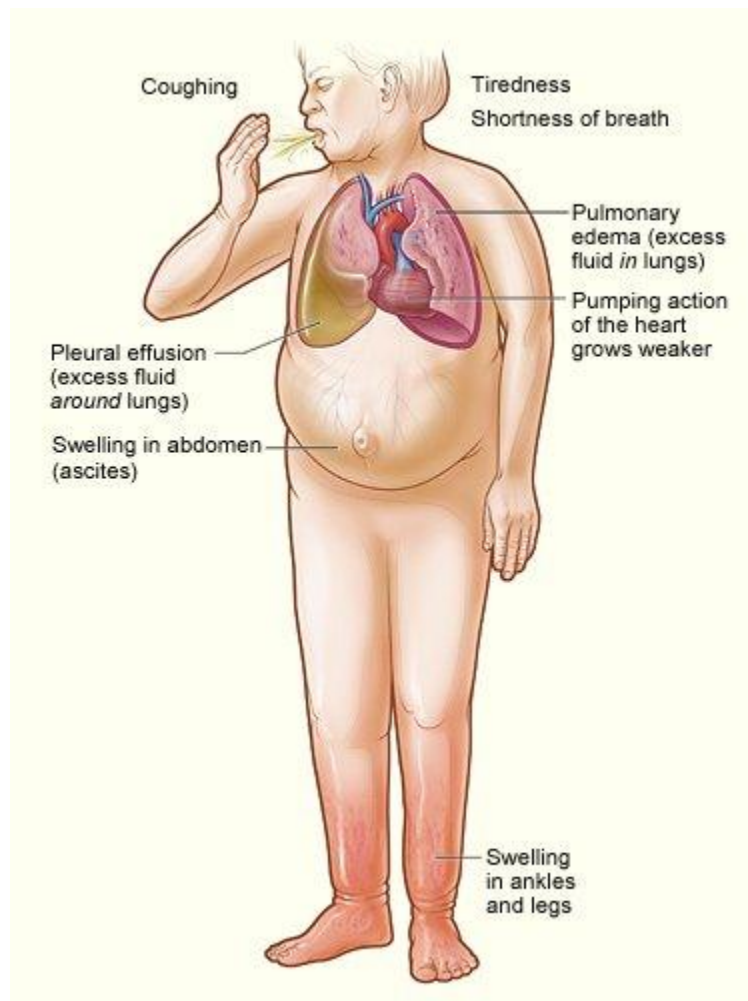


Figure 02: Signs and Symptoms of Cardiac Failure

Left- Sided Cardiac Failure

When a cardiac failure occurs due to the inefficient functioning of the left ventricle, it is known as a left- sided cardiac failure. In this situation, the left ventricle fails to generate enough force to distribute blood throughout the body. Consequently, blood accumulates in the left side chambers of the heart, eventually leading to pulmonary edema and pulmonary hypertension.

Causes

- Ischemic heart diseases
- Hypertension
- Aortic and mitral valvular diseases
- Primary myocardial diseases

Morphology

Heart – morphological changes of the heart depend on the severity of the condition. Left ventricular hypertrophy is typically seen along with other changes such as myocardial infarcts. Areas of fibrosis can be observed under the light microscope.

Lungs – owing to the congestion of the pulmonary circulation, lungs are heavy, wet and edematous.

Clinical Features

- Cough
- Dyspnea
- Orthopnea
- Paroxysmal nocturnal dyspnea
- If the renal perfusion is severely compromised there can be ischemic damages to the renal parenchyma and it can give rise to azotemia.
- Lack of blood supply to the brain can result in ischemic encephalopathy.

Right- Sided Heart Failure

Most frequent cause of right sided heart failure is the left -sided heart failure. If right sided heart failure occurs as a result of any pathology in the lungs, it is called cor pulmonale.

Left sided – heart failure

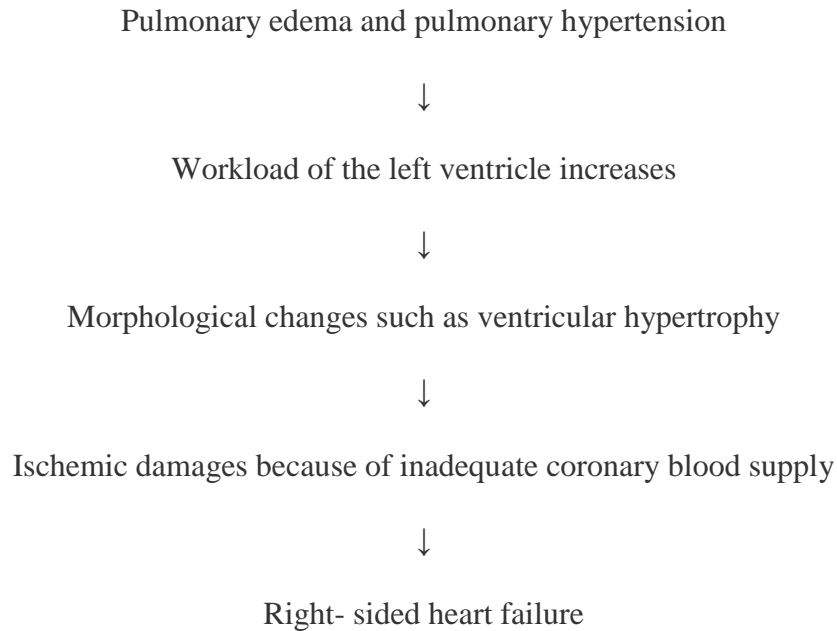


Blood accumulates in the left ventricle and left atrium



Stasis of blood in the pulmonary circulation





Morphological Changes

Heart – main change in the heart is the hypertrophy of the right ventricle

Liver and Portal System

Because of the congestion of the portal vessels, portal hypertension occurs, resulting in the enlargement of the liver which is known as the portal hepatomegaly.

Pleural effusion, pericardial effusion, and peritoneal effusions also can be seen.

What is the difference between Congestive Cardiac Failure and Cardiomyopathy?

Conclusion

The incidence of the diseases we have discussed here has dramatically increased within the last few decades. Sedentary lifestyle, alcohol consumption, unhealthy diet, and stress are believed to be the main contributory factors for this. Doing exercises regularly and paying more attention to your health is therefore extremely important if you do not wish to have a sudden death.

References:

Kumar, Vinay, Stanley Leonard Robbins, Ramzi S. Cotran, Abul K. Abbas, and Nelson Fausto. Robbins and Cotran pathologic basis of disease. 9th ed. Philadelphia, Pa: Elsevier Saunders, 2010. Print.

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