

Congestive Cardiac Failure

Definition:

This is a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood.

Congestive heart failure describes a condition where the heart muscle is weakened and cannot pump as strongly as before.

This means less oxygen is reaching the organs and muscles which can make feel tired and short of breath.

Types of heart failure:

1) Low output heart failure:

a) Systolic heart failure:

- ① Decreased cardiac output.
- ① Decreased left ventricular ejection fraction.

b) Diastolic heart failure:

- ① Elevated left and right ventricular end-diastolic pressures.

- ① May have normal left ventricular ejection fraction.

2) High-output heart failure:

- ① Seen with peripheral shunting, low-systemic vascular resistance, hyperthyroidism, beriberi, carcinoid, anemia.

Sub:

- ① often have normal cardiac output.
- ① Right-ventricular failure - seen with ~~pta~~ pulmonary hypertension.

3) Systolic dysfunction:

- ① ~~Coronary~~ coronary artery disease.
- ① Hypertension.
- ① valvular heart disease.

4) Diastolic dysfunction:

- ① Hypertension.
- ① coronary artery disease.
- ① Hypertrophic obstructive cardiomyopathy (HCM)
- ① Restrictive cardiomyopathy.

■ Etiology:

- ① Heart failure is caused by systemic hypertension in 75% of cases.
- ① Structural heart changes, such as valvular dysfunction, causes pressure or volume overload on the heart.
- ① Heart is unable to pump enough blood to meet tissues requirements.
- ① Congenital heart defects
- ① Severe lung disease.
- ① Diabetes.
- ① Severe anemia.
- ① Overactive thyroid gland (hyperthyroidism)
- ① Abnormal heart rhythms.

Increases



- ① Increase in pulmonary pressure results fluid in alveoli (pulmonary edema).
- ① Increase in systemic pressure results in fluid in tissues (peripheral edema)

Health conditions that either damage the heart or make it work too hard:

- ① coronary artery disease.
- ① Heart attack
- ① Heart muscle diseases (cardiomyopathy)
- ① Heart inflammation. (myocarditis)

Epidemiology:

- ① Five millions Americans have CHF.
- ① 550,000 new cases every year.
- ① 800,000 patients with CHF hospitalized every year.
- ① 250,000 die every year.
- ① 2.6% total population has this disease.
- ① Incidence and associated morbidity and mortality is expected to increase in future.

Risk factors:

- ① Hypertension.
- ① Fluid retention and worsening CHF
- ① Bradycardia and heart block.
- ① Concentration is pils with CHF exacerbation

Sub:

Signs and Symptoms of CHF:

- ① Shortness of breath often with activities or while lying flat.
- ① Weakness and fatigue.
- ① Awakening short of breath at night.
- ① Need for increased pillows at night - helps lungs drain of excess fluid.
- ① Coughing or wheezing
- ① Swelling of feet and legs or other dependent areas.
- ① Anorexia / loss of appetite.
- ① weight gain.
- ① Fatigue.
- ① Activity decrease.
- ① Cough (specially supine).
- ① Edema.
- ① Breathing problem.

Complication:

- ① Cardiac arrhythmia.
- ① Hypotension.

N/v:

- ① Amrinone - Thrombocytopenia, liver enzyme.
- ① Milrinone - Bone marrow suppression, liver toxicity.
- Neurologic: Headache, fatigue, insomnia, vertigo.
- GI: Vomiting, diarrhea, abdominal pain, constipation.

miscellaneous: Allergic, thrombocytopenia, necrosis.

Visual: colour vision (green or yellow), colored holes around the subject.

Heart: SA and AV node suppression, AV block, atrial ventricular arrhythmia.

Pathophysiology:

- ① In order to maintain normal cardiac output, several compensatory mechanisms play a role as under: compensatory enlargement in the form of cardiac hypertrophy, cardiac dilatation, or both.
- ② Tachycardia due to activation of neurohumoral system
Eg - release of norepinephrine and atrial natriuretic peptide, activation of renin angiotensin aldosterone mechanism.

Starling's law:

With limits the force of ventricular contraction is a function of the enddiastolic length of the cardiac muscle which in turn is closely related to the ventricular end diastolic volume.

- ① This is achieved by increasing the length of sarcomeres in dilated heart.
- ② Increases the myocardial contractility and thereby attempts to maintain stroke volume.

Sub!

Beta

Heart failure results in depression of the ventricular function curve...

- ① compensation in the form of stretching of myocardial fibers results.
- ① stretching leads to cardiac dilatation which occurs when the left ventricle fails to eject its normal end diastolic volume.

Compensatory mechanism:

- ① Sympathetic nervous system stimulation.
- ① Renin - angiotensin system activation.
- ① Myocardial hypertrophy.
- ① Altered cardiac rhythm.

Pathophysiology of CCF: (See pharmacotherapeutics)

Diagnosis and treatment: (See pharmacotherapeutics)

Drugs for treating CHF:

1) Vasodilators

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Captopril

Enalapril

Fosinopril

Lisinopril

Quinopril

Hydralazine

Isoxanbide

Minoxidil

Sodium.

2) Diuretics:

① Bumetanide

① Furosemide

① Hydrochlorothiazide.

① Metolazone.

3) Beta blockers:

- ① Metoprolol
- ① carvedilol.
- ① Bisoprolol.

4) Inotropic agents:

- ① Digoxin
- ① Digitoxin
- ① Dobutamine.
- ① Amrinone.
- ① Milrinone

5) calcium channel blockers:

- ① Nifedine.
- ① Diltiazem
- ① Verapamil
- ① Amlodipine
- ① Felodipine.

Patient counseling:

- ① life style changes.
- ① Monitoring for changes.
- ① Medications
- ① Surgery.
- ① Reduce stress.
- ① Keep track of symptoms and weight and report any changes or concern to the doctor.
- ① Limit fluid intake.
- ① See the doctor more frequently.

Sub:

Lifestyle changes:

- ① Stop smoking.
- ① Loose weight.
- ① Avoid or limit alcohol.
- ① Avoid or limit caffeine.
- ① Eat a low-fat - sodium diet.
- ① Exercise

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- ① Bisoprolol

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