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Physiotherapy cardio-respiratory Clinic Course L 10 & 11 : Heart Failure

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Contents

- ❖ Definition
- ❖ Classification
- ❖ Causes
- ❖ Presentation
- ❖ Investigation
- ❖ Management

Heart Failure

Heart failure: progressive disorder in which the heart is unable to pump sufficient blood to meet the needs of the body.

New York Heart Association Functional Classification (NYHA)

- I. Heart disease present, but no undue dyspnoea from ordinary activity.
- II. Comfortable at rest; dyspnoea on ordinary activities.
- III. Less than ordinary activity causes dyspnoea, which is limiting.
- IV. Dyspnoea present at rest; all activity causes discomfort

Clinical presentation:

1. Dyspnea (pulmonary oedema)
2. Lower limb oedema and liver enlargement (congestion)
3. Fatigability (hypoxia)

Causes:

- A- Ischemic heart disease
- B- Hypertension
- C- Valvular lesions
- D- Cardiomyopathy.

Investigations:

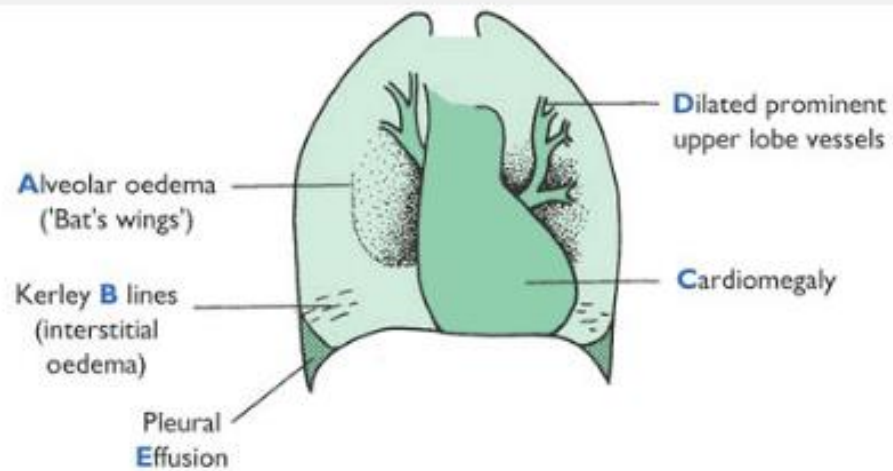
- If ECG and BNP (b-type natriuretic peptide) are normal, heart failure is unlikely and an alternative diagnosis should be considered; if either abnormal, then an Echo is required.
- Blood tests: FBC; U&E; BNP
- CXR: Cardiomegaly (cardiothoracic ratio >50%)
- ECG may indicate cause (look for evidence of ischaemia, MI, or ventricular hypertrophy).
- Echocardiography is the key investigation.

Cardiac failure

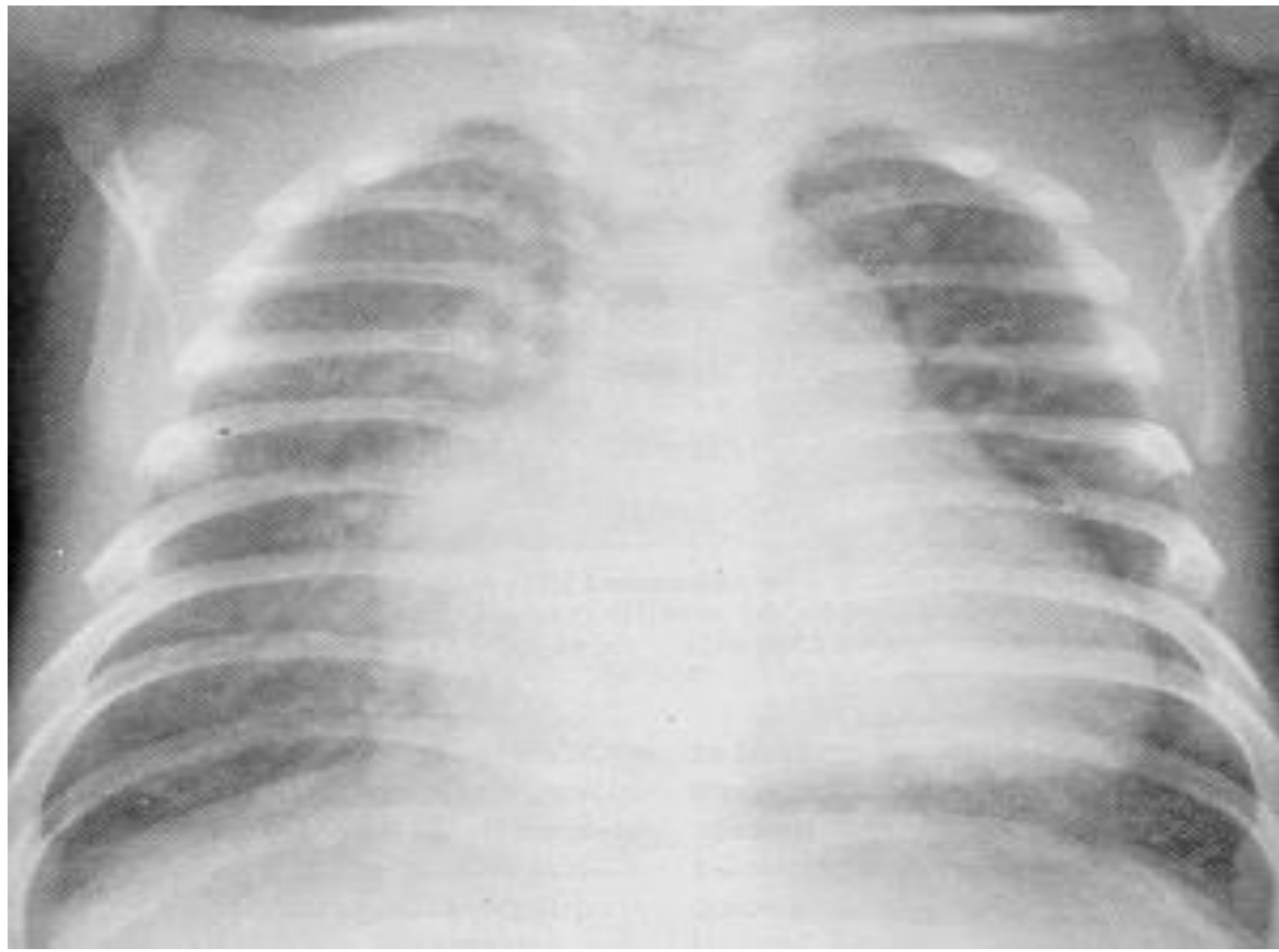


Compensation of heart failure:

- A- Sympathetic overactivity due to low blood pressure
- B- Renin angiotensin system stimulation due to renal low perfusion
- C- Hypertrophy and diltation of cardiac muscles



These features can be remembered as **A, B, C, D, E.**



Management of heart failure:

A- bed rest.

B- low salt intake.

management of heart failure:

A-Diuretics: Diuretics decrease plasma volume and, subsequently, decrease venous return to the heart (preload) Example ; loop diuretic (furosemide)

- Common side effect: hypovolemia and hypokalemia.

B- vasodilator agent: ACEI OR ARBS.

ACEI used in HF started with low dose , to prevent hypotension .

Angiotensinogen
(γ -globulin in blood)

Renin
(from kidney)

Angiotensin I
(inactive)

ACE
inhibitors

Decreased
angiotensin II

ACE inhibitors decrease circulating levels of angiotensin II, which has the four major effects shown.

Output of
sympathetic
nervous system

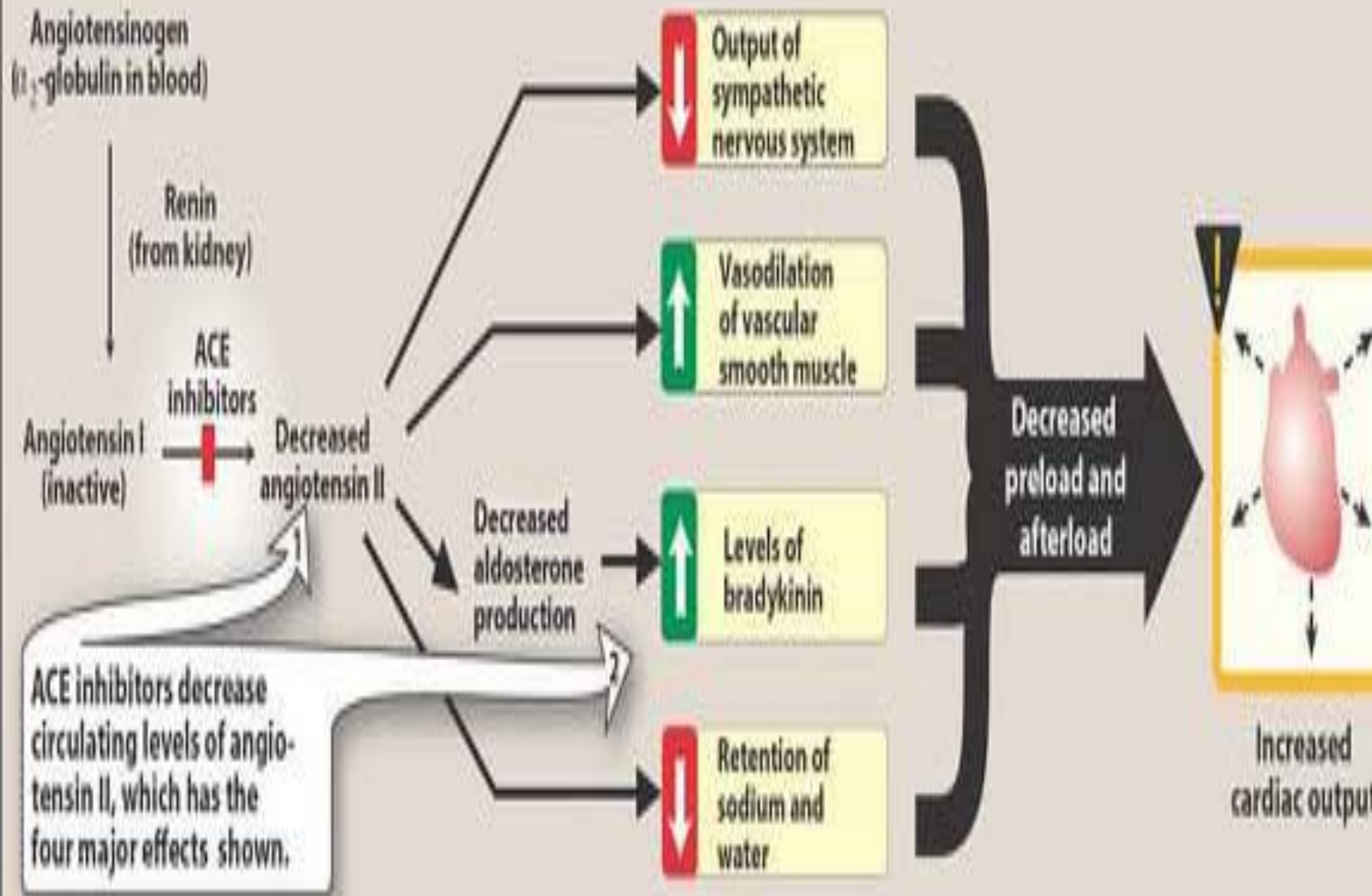
Vasodilation
of vascular
smooth muscle

Levels of
bradykinin

Retention of
sodium and
water

Decreased
preload and
afterload

Increased
cardiac output



C- Beta Blockers: reduce mortality in patients with HF but contraindicated in acute severe HF. Start beta blocker in stable heart failure.

Beta blockers used in heart failure:

1. Carvidolol (non selective alpha and beta)
2. Metoprolol (selective beta 1 blockers)
3. Bisoprolol (selective beta 1 blockers)

- In Pt not response to loop diuretic , ACEI and beta blocker can used spironlactone or digoxin.
- Pt with contraindication of ACEI can used combination nitrate + hydralzine.

D. Inotropic Drugs: *Digitalis(digoxin).*

Mechanism of action: Block Na^+ , k^+ pump.lead to increase Ca^+ inside the cardiac muscle result in increase contractility

End