

Heart failure

القلب من قادر يرفع بالية للقلوية

Complex clinical syndrome characterized by inability of the heart to contract (pump) or to fill blood sufficient to O₂ requirements of the body despite compensatory mechanisms

* preload → "Venous return" Rt. Vent. pressure, الدم الراجع على القلب من كل إلى

* Enotropic effect → ↑ venous return increase contraction

* Afterload → peripheral vascular resistant

Mechanical view

① القلب من قادر يرفع الدم ← الدم الواصل للorgans قليل ← Cardiac output ↓

② الدم الراجع بلاية قدامه HF فيه Congestion ← anasarca, JVP, hepatomegaly, LL edema

Involving Systems

① RAS system

Angiotensinogen → Renin → Angiotensin 1 → ACE enzyme → Angiotensin 2

→ Activation of this system chronically in:

① HF

② HTN

③ Obesity hypoventilation \$

④ Cardiorenal \$

⑤ Sleep apnea \$

angiotensin 2 act on receptors cause VC, HTN, ↑ afterload → receptor 1

Cause VD, Salt excretion, ↓ HTN, ↓ H₂O → receptor 2

Drugs for RAS system

① ACE inhibitors

adverse effect

non selective

dry cough → ↑ bradycinin

↑ plasma renin activities → VC, HTN, cause target organ damage

Escape phenomena → by tissue partitioning

①

* tissue pathway cause escape phenomena

[2] ARBs selective at receptor I

adverse effect → ↑ plasma renin activity
→ tissue pathway

[3] Direct renin inhibitor (DRI) alisectine

[2] Sympathetic nervous system "epinephrin, norepinephrin"

Chronic activation of SNS cause tachycardia, HTN, ↑ hypertrophy,
↑ arrhythmia, ↑ ischemia

adverse effect: target organs damage

Drugs: β blocker, α blocker, Ivabradine

→ Ivabradine → IF receptors, β blocker analogue "work as β blocker"

indications: ① Contraindication β blocker → bronchial asthma

② Maximum dose of β blocker with tachycardia

* SA node has not fast sodium channels, has IF receptors "2 pumps potassium and sodium", has inherited permeability for sodium

-55 μ sec for sodium μ sec for SA node membrane

action potential μ sec

permeability of sodium in AV node μ sec; μ sec *

~~Contraindication for β blocker~~

[3] Endopeptide reverse RAS system → ↓ sodium, ↓ pressure, ↓ edema, ↓ hypertrophy
cause target organ protection

Function → cause balance to RAS and sympathetic system

Types → ① ANP → in atrium

② BNP → in ventr.

③ ^① CNP → in vascular endothelium cause degradation of ANP, BNP

[2]

سوال نمبر

* هو الرابض في HF هو الوصل الى بكونه عالي

Drugs:

inhibitor for Neprilysin Sacubitril

Sacubitril + Valsartan $\Rightarrow$ Entregato "ARNI"

↓
↓ Nephrilysin

↓
ARBS → ↓ RAS

Etiology :

كل أمراض القلب بلا استثناء بتعمل HF

1] Ischemic heart disease MCC in both gender

→ Massive MI cause Scar cause HF

→ decrease blood supply cause Ischemic Cardiomyopathy

2] Vulvar HD 2nd mce in males

→ MS, MR, AS, AR

3 Cardiomyopathy 2nd mce in females

especially peripartum cardiomyopathy at 3rd trimester or 6 mon. after deliv

in all types I Dilated cardiomyopathy

2) НОСМ

[3] Restrictive CM.

Q4) HTN

[5] Myocarditis Common in young males

→ post viral myocarditis

→ if not diagnosed well he will come with dilated cardiomyopathy.

6 Arrhythmia

Symptoms

- Lt side: ① dyspnea with all its grades *NYHA classification*
② $\downarrow$ CO symptoms $\rightarrow$ dizziness, Vertigo, easy fatigability
chest pain, oliguria, general weakness, palpitation, sweating
③ Recurrent chest infection "pneumonia"
chronic, acute, ~~new~~ $\rightarrow$ symptoms ~~subacute~~ $\rightarrow$

- Rt side: ① LL edema
② Rt hypocondrial pain
③ ascites $\rightarrow$ anasarca
④ congested dilated neck vein

ascites precoc: ascites without LL edema, caused by chronic pericarditis

Framingham Criteria *we need 3 major or 5 minors*

Major Criteria

- ① orthopnea
- ② paroxysmal nocturnal dyspnea "PND"
- ③ Crepitation $\Rightarrow$ pulmonary edema
- ④ gallop rhythm S_3 or S_4 + tachycardia
- ⑤ cardiomegaly in x-ray
- ⑥ hepatojugular reflux

Minor Criteria

- ① LL edema
- ② hepatomegaly
- ③ ascites
- ④ ~~congested~~ congested neck veins
- ⑤ Dyspnea
- ⑥ tachycardia
- ⑦ wt loss

Killip Classification in acute MI

- Class 1 → dyspnea, gallop rhythm, with no crackles 5% mortality
Class 2 → dyspnea, gallop rhythm, with basal crackles 25% mortality
Class 3 → pulmonary edema crackles in all lung 40% mortality
Class 4 → Cardiogenic shock "pump failure" 60% mortality
L₁ > 40% of Lt vent. necrosis

How to approach?

- ① History
- ② Examination
- ③ Investigation

Biomarkers → BNP → low exclude HF but can't confirm
→ High may HF or any thing else

- Echo
- X-ray
- CBC
- ECG

Treatment

- ① Diuretics *
- ② B-Blocker *
- ③ ACE inhibitors or ARBs *
- ④ Spironolactone → $\text{I}_{1}, \text{I}_{2}$
- ⑤ SGLT2 inhibitor *