



核心課程編號：B30

心臟衰竭

心臟內科 劉俊廷醫師

109年03月01日 第三版



學習目標

PGY	UGY
<p><u>知識</u></p> <p>CHF相關進階心電圖、運動心電圖、核子醫學掃描及心臟超音波檢查之判讀</p> <p>CHF所需使用之侵入性檢查</p> <p>CHF治療藥物的使用</p> <p>CHF外科手術、心臟移植時機與評估</p>	<p><u>知識</u></p> <p>心臟解剖學及生理學</p> <p>CHF的定義及臨床表現</p> <p>CHF的病因及致病機轉</p> <p>CHF的基本診斷（包括能應用紐約心臟學會心臟衰竭功能性分類及美國心臟協會/美國心臟學會心臟衰竭分級）</p> <p>CHF之胸部X光、心電圖之判讀</p> <p>CHF的治療原則</p> <p><u>技能</u></p> <p>CHF相關的病史詢問</p> <p>CHF相關的身體檢查</p>



心臟衰竭定義

心臟衰竭指心臟功能異常，以至於無法幫浦足夠的血量來滿足身體組織代謝之需求。



心臟衰竭成因

❖ 常見心臟本身的疾病

1. 直接心肌損傷

- (1) 動脈硬化性心臟病
- (2) 維他命缺乏
- (3) 心肌炎
- (4) 心肌病變



心臟衰竭成因

2. 心室負荷過重 (Fluid overload)

(a) ASD

(b) VSD

(b) Aortic regurgitation

(c) mitral regurgitation

(d) PDA



心臟衰竭成因

❖ 心室負荷過重 (pressure overload)

(a) Aortic stenosis

(b) Uncontrolled hypertension



心臟衰竭成因

3. 心室填充受限

- (1) Mitral stenosis
- (2) constrictive cardiomyopathy
- (3) restrictive cardiomyopathy



心臟衰竭成因

❖ 使心臟衰竭加重的疾病

- 1.pulmonary embolism
- 2.infection, anemia, thyrotoxicosis, pregnancy
- 3.arrythmia,
- 4.hypertension with poor control
- 5.myocardial infarction
- 6.excess salt intake
- 7.emotional change



心臟衰竭形式

❖ High output vs low output

1. Cause of high output HF:

Thyroidotoxicosis, anemia, pregnancy, AV fistula, beriberi, Paget's disease

2. Cause of low output HF:

Ischemic cardiomyopathy (CAD), HCVD, other cardiomyopathy, valvular heart disease, pericardial disease



心臟衰竭形式

❖ Right side vs left side HF

1. Left side HF: left ventricle overload: like aortic stenosis or myocardial infarction
2. Right side HF: pulmonary embolism, pulmonary stenosis, pulmonary hypertension and right ventricular infarction



心臟衰竭形式

❖ Systolic vs diastolic HF

1. 收縮性心衰竭為心室的收縮力降低以致心輸出量不足
2. 舒張性心衰竭為心室填充壓升高以致心室無法適當的填充血液而導致肺充血而出現 症狀, 常見的疾病為高血壓引起的心室肥厚



心臟衰竭診斷

❖ Clinical presentaion

1. Dyspnea : esp. in effort
2. Orthopnea: esp. is severe heart failure
3. paroxymal nocturnal dyspnea (PND): esp. in left heart failure
4. Cheye-stokes respiration
5. Cardiac asthma



心臟衰竭診斷

❖ Physical exam

1. appearance: acute ill looking, malnutrition in chronic state
2. increased adrenergic activity: pale skin , cold and cyanotic distal limbs
3. Rales: in pulmonary edema



心臟衰竭診斷

4. Increased jugular pressure
5. Hepatojugular reflux
6. Congested hepatomegaly
7. Edema , pleural effusion, ascites
8. Cardiomegaly, audible S3 and S4, audible murmurs in VHD



心臟衰竭診斷

❖ Lab exam

1. elevated BNP: increased RA tension, not always means heart failure
2. ECG: myocardial ischemia or hypertrophy or conduction disease
3. CXR: redistribution of pul flow, Kerley's B line , pleural effusion, cardiomegaly



心臟衰竭診斷

❖ Lab exam

4. echocardiography
5. Radionuclide heart function study
6. Cardiac catheterization



心臟衰竭治療

- ❖ 控制心衰竭狀況
- ❖ 治療潛在性心臟疾病
- ❖ 治療加重心衰竭因子



心臟衰竭治療

❖ 控制心衰竭狀況

降低心臟的preload and afterload

- (1) 減少活動量,降低血壓
- (2) 減少熱量攝取,控制體重



心臟衰竭治療

❖ 控制心衰竭狀況

控制過多的鹽分攝取及水分滯留

1. 飲食: salt and water restriction

2. 利尿劑:

(1) Thiazide: 輕到中度心衰竭, $CR < 2.0$

side effect: hypokalemia, metabolic alkalosis



心臟衰竭治療

❖ 控制心衰竭狀況

- (2) furosemide, bumetidine, ethacrynic acid
(loop diuretics): good effect,
hypokalemia,
hypovolemia, pre-renal azotemia
- (3) aldosterone antagonist: spironolactones
Hyperkalemia, good effect with above
diuretics



心臟衰竭治療

❖ 控制心衰竭狀況

血管擴張劑治療: reduction of afterload and preload

1. mainly on artery dilatation: hydralazine, minoxidil, alpha-blockers, CCB
2. mainly on venous dilatation: nitroglycerin
3. balanced vasodilators: ACEI, nitroprusside



心臟衰竭治療

❖ 控制心衰竭狀況

Beta-blocker:

1. Decrease sympathetic activity
2. Avoid in advanced (NYHA FC IV) or acute decompensated LV dysfunction
3. Titrate from very low dose
4. Only evidence in limited kinds of drugs



心臟衰竭治療

❖ 增強心肌收縮力

1. Digitalis:

- (1) 增加心搏出量,改善利尿功能,降低 preload
- (2) 對慢性缺氧性心臟病引起之心室收縮力變差有良好效果
- (3) 對心房顫動引發之心衰竭有良好效果



心臟衰竭治療

Digitalis

- (4) 治療濃度範圍低,常造成中毒,尤其是低血鉀狀態
- (5) 中毒性心電圖最常見為VPC,另外也會出現AV block, atrial tachycardia
- (6) 缺乏臨床大型實驗支持療效



心臟衰竭治療

❖ 類交感神經藥物

大部分作用在Beta- adrenergic receptors

1. Dopamine

(1) low dose (1-2 ug/kg/min):

dopaminergic effect, increase renal and mesentery flow

(2) 2-10 ug/kg/min : beta agonist, increase contractility of heart



心臟衰竭治療

❖ 類交感神經藥物

1. Dopamine

(3) >10 ug/kg/min: alpha agonist, increase BP

2. Dobutamine

dosage is 2.5-10 ug/kg/min, increase heart contractility



心臟衰竭治療

❖ 類交感神經藥物

Amrinone: bipyridine, non catecholamine, nonglycoside, inhibit phosphodiesterase, increase heart contractility and vasodilatation



心臟衰竭治療

❖ 治療潛在性心臟疾病



- ❖ 1. Valvular heart disease: surgery intervention
2. Ischemic heart disease: PCI or CABG
3. Congenital heart disease (abnormal shunting) :Surgery or endovascular intervention



心臟衰竭治療

❖ 治療加重心衰竭因子

1. control infection
2. control arrhythmia
3. control thyrotoxicosis
4. improve nutritional status
5. correct comorbidity
6. control blood sugar
7. treat risk factors for heart disease