Question 81 – Cardiology
A 67-year-old woman with congestive cardiac failure remains despite treatment with 40 mg frusemide and 20 mg enalapril daily. On examination she has a pulse rate of 80/minute, blood pressure of 125/70 mmHg and a jugular venous pressure (JVP) of +1 cm. She has a soft systolic murmur with no added sounds, her chest is clear and she has no oedema. An ECG shows sinus rhythm. A chest X-ray shows cardiomegaly with a cardiothoracic ratio of 15.5/28 but no pulmonary congestion. Echocardiography demonstrates systolic dysfunction with fractional shortening of 18% and mild mitral regurgitation. Her serum creatinine level is normal.

Which of the following is the most appropriate next step in treatment?
A. Increase the frusemide dose.
B. Add digoxin.
C. Add an aldosterone antagonist.
D. Add an angiotensin II receptor antagonist.
E. Add a beta blocker.

Answer E.

Cause of Heart failure
1) Coronary heart disease - ischemic cardiomyopathy
   - systolic dysfunction
2) Cigarette smoking
3) Hypertension
   - Framingham Heart Study: lifetime risk of developing HF X2 in subjects with bp 160/100 compared to < 140/90
4) Overweight
5) Diabetes
6) Valvular heart disease - calcific aortic stenosis

Types of cardiac failure
1) systolic
2) diastolic
   - as with aging, hypertension, DM, L ventricular hypertrophy, coronary disease and infiltrative cardiomyopathies
   - tend to be older and overweight
   - women > men
   - have renal dysfunction,

Investigations
1) 12 lead ECG
   - if normal, then heart failure due to L ventricular systolic dysfunction is unlikely
2) Chest Xray
3) FBE, UEC, LFT, TFT, fasting lipids
4) Urinalysis to detect proteinuria or glycosuria
5) TTE
6) Plasma concentration of B type natriuretic peptide/ N-terminal pro- B type natriuretic peptide

Treatment
1) Treatment of underlying cardiac disease
   - reduce preload (to diminish congestive Sx) & afterload(to improve cardiac function)
2) Lifestyle management
   - low salt diet ( 
     - regular aerobic exercise to improve peripheral muscle function 
   - annual influenza vaccination 
   - smoking cessation
2) Drugs
   a) Diuretics
      - for rapid symptomatic relief

Other causes to impress examiner
alcohol/cocaine abuse
OSA
nutritional deficiencies
myocarditis
hemochromatosis
sarcoidosis
thyroid disease
SLE
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- on its own exacerbates neurohormonal activation, therefore demands the use ACE-I and beta blocker

b) ACEi
- introduced at low dose and titrated upwards over several weeks
- monitor symptoms, bp and Cr

c) AR2B
- Valsartan HF trial: patients did not live longer when added to ACEi but did show a reduction in risk of admission to hospital for for worsening HF

d) B- blocker
- carvedilol, bisoprolol, metoprolol
- start at low dose and titrate gradually over several weeks
- improve survival
- provide anginal relief
- minimize risk of cardiac decompensation

e) Spironolactone (25-50mg/d)
- reduces mortality in pts with moderate or severe Sx due to systolic HF

f) Digoxin
- symptomatic treatment of pts with HF & AF
- no evidence that dig improves survival in pts in sinus rhythm

Drugs that interact with anti-failure drugs or increase fluid retention:
  - NSAIDS
  - Ca antagonist
  - Lithium
  - parenteral corticosteroids
  - tricyclic antidepressants increase risk of arrhythmias

3) Cardiac surgery
- coronary bypass surgery if it is the primary cause of HF → muscle is still alive but not contracting has the potential to recover after revascularisation
- vavular heart surgery → lead to improvement in cardiac function and resolution of Sx

4) Implantable cardioverter-defibrillators
- primary prevention to reduce total mortality in pts who
  a) 40d post MI
  b) LVEF < 30%
  c) NYHA Class II or III Sx while on chronic medical therapy
  d) reasonable expectation of survival with good functional status for > 1yr
  --secondary prevention in pt with
  a) current or prior Sx of HF
  b) reduced LVEF
  c) Hx of previous cardiac arrest or episodes of sustained ventricular tachycardia

5) Cardiac resynchronization therapy
a) LVEF < 35%
   b) sinus rhythm
   c) NYHA class III or IV despite optimal medical therapy
   d) cardiac dyssynchrony (QRS duration > 0.12)

6) HARP team
- these teams have shown to reduce rate of admission to hospital
- pt education to identify their early signs of deterioration
  a) daily weigh
  b) educated to adjust the diuretic dose at early stage of decompensation
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