Myocarditis

This is acute or chronic inflammation of the myocardium - and may present similarly to MI.

Epidemiology: More freq in children & young adults. Post-mortem studies suggest it is a major cause of sudden unexpected death in adults, implicated in ~20% of those aged <40 years.

Causes

Infection – lots of candidates all rare except for viral

- *Viral:* **Coxsackievirus, enteroviruses, adenovirus, HIV**, EBV, CMV, Hep A&C, influenza, HSV, RSV, measles, mumps, rubella and parvoviruses, vaccinia, Herpes/varicella zoster...
- *Bacterial:* Brucella, gonococcus and meningococcus, *H influenzae*, mycobacterium, *Strep. spp*, salmonella, *Staph.* spp, *Mycoplasma, Trep. pallidum*, *C. diphtheria* and *V. cholerae*.
- *Spirochetal:* e.g. Lyme disease (borrelia) and leptospira
- *Fungal:* e.g. Actinomyces, aspergillus, candida, cryptococcus, histoplasma.
- *Protozoal:* e.g. *Toxoplasma gondii* and *Trypanosoma cruzi*
- *Parasitic:* e.g. Ascaris, schistosoma
- *Rickettsial:* e.g. Q fever (*Coxiella burnetti)*

Immune Mediated

- *Autoantigens:* **Chagas' Disease** (most common worldwide), **Sarcoidosis, SLE, Rh F., Scleroderma**, *Chlamydia pneumoniae*, Churg-Strauss syndrome, Giant-cell myocarditis, IBD, IDDM, Kawasaki's, Myasthenia gravis, polymyositis, thyrotoxicosis, Wegener's granulomatosis.
- *Allergens:* Drugs (acetazolamide, amitriptyline, cefaclor, colchicine, frusemide, isoniazid, lidocaine, methyldopa, penicillin, phenytoin, tetracycline, thiazides and tetanus toxoid).
- *Alloantigens:* Heart-transplant rejection

Toxic Myocarditis

- *Drugs:* **Ethanol, cytotoxic antibiotics** (anthracyclines, e.g. doxorubicin), amphetamines, cocaine, cyclophosphamide, fluorouracil, lithium, interlukin-2 and trastuzumab.
- *Heavy metal poisoning:* lead, copper, iron
- *Physical agents:* Electric shock, hyperpyrexia, radiation
- *Others:* arsenic, insect stings and bites, phosphorus, carbon monoxide and inhalants

Symptoms and signs: From asymptomatic with ECG abnormalities to severe heart failure. Patients commonly complain of flu-like prodrome, fever, fatigue, dyspnoea, chest pain and palpitations. There may be a tachycardia, soft S1, S4 gallop, and signs of heart failure.

Investigations *ECG:* ↑HR, ↑ or ↓ST, ↓T waves, atrial arrhythmias, transient AV block. *CXR.* Cardiomegaly common. *Echo.* For cardiac fn. *Bloods:* FBC, U&E, CK, Trop, ESR or CRP, LFT, serology, autoantibodies. *Myocardial biopsy:* limited sensitivity <70%. *Antimyosin scintigraphy*

Management: Treat underlying cause. Pharm. support. Mechanical support (ECMO, ventricular assist devices). Steroids/immunodepressants Rx for autoimmune causes. Ongoing trials on antiviral agents/viral vaccines. Cardiac monitoring. CCU/ICU. May need transplantation.

Prognosis: Most mort in first 72-96hrs. 95% survival if mech. support not reqd for first 72hrs. Commonly progresses to chronic HF or dilated cardiomyopathy. Better prognosis in children.