



Infective Endocarditis

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Pathophysiology

Non bacterial thrombotic endocarditis (sterile vegetations) forms in areas of turbulent flow

- bacterial infection of thrombus develops following bacteraemic episodes
- sequestration of bacteria in thrombus that phagocytic cells cannot penetrate
- intermittent embolisation of infective emboli

Prosthetic valve endocarditis hallmark = ring abscesses

Mitral > aortic > tricuspid > pulmonary (tricuspid most common in IV DU)

Micro-organisms

Most common: staph aureus

Poor prognosis, rapid destruction, infects normal valves, high virility, esp TV

Most common in abnormal valves: strep viridans

Others:

Other strep (sanguis/bovis/mutans)

Staph epidermidis

Enterococcus and coag neg staph (usually abnormal MV/AV, low virility)

HACEK (gram neg Haemophilus, aeromonas, cardiobacterium hominis, eikenella, kinginella)

Fungi

Culture negative 5-10%

Paeds: Staph aureus, strep, candida, aspergillus

In native valves

Mortality 25% (50% if aortic valve; 56% if HIV)

Acute has worse prognosis (and affects young patients with normal valves)

100% mortality if untreated

L>R

In prosthetic valves

3% incidence in prosthetic valves in 1st year, 1%/yr thereafter

50% mortality overall (75% in early infections due to incr virulence of MO (ie. Staph aureus), 40% in late, 90% if fungal, 85% if staph)

No significant difference in risk between bio and mechanical

Risk factors

Valvular heart disease (MVR most common in developed world; calcific AS)

Other structural heart disease (bicuspid aortic valve most common)

RHD (leading RF in developing countries)

Poor dental hygiene, dialysis, DM, HIV, male, hypercoag state (SLE, malignancy)

IV DU

20% admissions with fever are endocarditis

30x general population; 2-5% risk per year

40% recurrent

Usually normal valve; R>L (TV > MV > AV)

Embolise to lungs therefore cause resp symptoms



Duke Criteria

90% sensitive

2 major or 1 major + 3 minor or 5 minor

Major:

B = blood culture +ve >2 times 12 hr part

E = Endocardial involvement from Echo

Minor:

F = Fever >38

E = Echo findings (not fulfilling a major)

V = Vascular findings

EE = Evidences from microbiological/immunology (2 evidences)

R = Risk factors/predisposing factors - drug abuse, valvular diseases

Assessment

Acute vs subacute (more non-specific symptoms)

Symptoms usually present for 10-14/7; classical signs often absent if prosthetic valve

Symptoms

FROM JANE

Fever

Roth spots

Retinal haem with central clearing

Osler's nodes

Tender nodules on tips of fingers or thenar eminence, sterile

Murmur (85%)

Janeway lesions

Painless, haemorrhagic, palms/soles, contain bacteria

Anaemia

Nail (splinter) haemorrhages (>4)

Emboli

Esp fungal eg. FND; MCA CVA most common neuro; retinal artery emboli, PE, MI, splenic infarct

Mycotic aneurysm - SAH

Also:

New onset CCF (70%)

Microscopic haematuria, proteinuria

Finger clubbing

Hepatomegaly, splenomegaly

Chills, weakness, SOB > constitutional Sx > AP, CP, back pain

Investigations

Bloods

Normal/incr WBC (incr in 50% prosthetic)

Incr ESR (>90%)

Haemolytic anaemia (70-90%; esp if prosthetic)

+ive RF

Persistently +ive blood cultures (always do before Abx)

Urine: Haematuria (in 50%)

ECG: RBBB, LBBB, HB, PR depression; cardiac monitor if new conduction defect

CXR: pneumonia (25%), septic emboli findings (25%), APO (15%); normal in 35%

Echo: TTE sens 65% (88-98% in TinTin); TOE sens 85%, spec 95% (recommended if prosthetic valves, fat/COPD etc..., high risk)



Management

Always admit febrile IVDU/febrile patient with prosthetic valve for assessment

Anticoagulation not indicated

Start Abx before blood culture results

IV Abx for 2-6/52

Acute = ampicillin 2g Q4h (or benpen 60mg/kg) + fluclox 2g Q4h + gent 5mg/kg OD

Subacute = ampicillin (or ceftriaxone or vanc) + gent

Prosthetic/IVDU = ceftriaxone (if > 1yr since replacement, to cover HACEK) + vanc + gent

Valve replacement

If mod-severe CCF/pseudomonas/brucella/coxiella burnetti/fungal/new ECG changes/unstable prosthesis/staph aureus in prosthetic valve/persistent bacteraemia despite ABx

Usually not needed if prosthetic valve > 1yr old

Delay surgery if recent ICH or cerebral embolism

If prosthetic: stop anticoagulation if staph aureus (high risk of ICH)

Abx prophylaxis

Although widely used, has never been shown to be effective

Give PO 1hr before/IV immediately before; use amoxicillin / clindamycin / cephalexin / vanc

If: prosthetic valve, prev IE, unrepaired cyanotic defects, post-cardiac transplant, HOCM, RHD

+ procedure with >70% risk of bacteraemia = I+D of abscess, reimplantation tooth, dental abscess drainage, SVD with prolonged labour

NOT for prev ASD/VSD/PDA repair

NOT for IDC, ETT, IVA, ICC placement, NGT placement, PEG tube placement, D+C, normal SVD

Complications

Valvular damage - CCF (esp if aortic valve; 50% fatal if aortic valve), regurg, obstruction

Myocardial abscesses - AV block

Immune complex disease

Thromboembolism: in 50%, subsequent infarction and infection

65% brain > lung, spleen, kidney, liver

Pericarditis, mycotic aneurysm, intracranial haemorrhage

Prosthetic valve problems - dehiscence, leak, stenosis