RIGHT SIDED ENDOCARDITIS BETWEEN IV DRUG ABUSE AND HEALTH CARE ASSOCIATED

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RIGHT- SIDED INFECTIVE ENDOCARDITIS

• Prevalence
  rare (5-10 % of all IE)
  ...but increasing

• types

  1. Intravenous drug abusers
  2. Health care associated (PPM, ICD, CVC; CHD)
RIGHT- SIDED INFECTIVE ENDOCARDITIS

DIAGNOSIS

Duke criteria, Modified Duke criteria,

Clear deficiencies remain and clinical judgement remains essential, especially in negative blood cultures, prosthetic valve or intracardiac devices endocarditis

BE CAREFUL

THIS MACHINE HAS NO BRAIN
USE YOUR OWN
RIGHT-SIDED ENDOCARDITIS

1. INTRAVENOUS DRUG ABUSERS

The “good” guy...
RIGHT-SIDED ENDOCARDITIS

INTRAVENOUS DRUG ABUSERS

• Epidemiology

  incidence 60x >, 1.5-3.3/1000/year

  >>> HIV + with advanced immunosuppression

• Pathophysiology

  - Contaminated drug solutions
  - Poor injection hygiene
  - Decreased immune function
RIGHT-SIDED ENDOCARDITIS
INTRAVENOUS DRUG ABUSERS

• Localization
Tricuspid valve
(Pulmonary, Eustachian valve rare)

• Agents:
Staphylococcus areus (60-90%)
Other: epidermidis?
Pseudomonas aeruginosa, other gram-
Fungi, Enterococci, streptococci
Polymicrobial infections
RIGHT-SIDED ENDOCARDITIS
INTRAVENTOUS DRUG ABUSERS

• clinical diagnosis and complications

Persistent **fever** + respiratory symptoms
(Pleuritic chest pain, cough, hemoptysis, from **multiple septic pulmonary embolus**)

Complications
- Pulmonary infarction/ abscess pneumothorax/
- Purulent pleural effusion
- Right heart failure (PHT or major TR)
- Systemic embolism
  (= paradoxical or associated left sided)
RIGHT- SIDED ENDOCARDITIS
INTRAVENTOUS DRUG ABUSERS

• **Diagnosis**
  IVDA+fever+respiratory symptoms ➞ exclusion of endocarditis
  TTE IS ENOUGH in most cases (anterior location, large vegetations)
  (TEE- non tricuspid endocarditis, left sided)

• **Prognosis**
  Relatively good:
  in-hospital mortality rate <10%

Worse prognosis
Fungal etiology,
vegetations> 20mm,
CD4 < 200 cells/µL
RIGHT- SIDED ENDOCARDITIS
INTRAVENOUS DRUG ABUSERS

• Antimicrobial therapy

  - Empirical ➔ *S. aureus* must be ALWAYS covered
    (Vancomycin-MRSA or Penicillins penicillinase resistant-MSSA)

Selected cases:
Pentazocine addiction = antipseudomonas agent
Brown heroin with lemon juice = antifungical agents
RIGHT- SIDED ENDOCARDITIS
INTRAVENOUS DRUG ABUSERS

• 2 week treatment (oxacillin or cloxacillin) IF LOW RISK
  (MSSA and vegetations < 20 mm and good response to treatment and absence of metastatic extracardiac sites of infection/complications and absence of left side or prosthetic valve and absence of severe immunosupression with or without AIDS)

• 4-6 weeks treatment is a must IN HIGH RISK
  (AB other than penicillins, slow clinical or microbiological response (>96h), vegetations >20mm, metastatic extracardiac sites of infection/complications left side or prosthetic valve severe immunosupression with or without AIDS)
**RIGHT- SIDED ENDOCARDITIS**

**INTRAVENTOUS DRUG ABUSERS**

- **Surgery**
  - Good response to AB (>85%) + high risk of recurrence
  - Conservative approach

**SURGERY**

1. Non controlled infection despite antimicrobial treatment (bacteriemia <7days) or fungi
2. Refractory right heart failure due to severe TR
3. Tricuspid vegetations > 20mm and recurrent embolism
RIGHT-SIDED ENDOCARDITIS
INTRAVENOUS DRUG ABUSERS

• Surgery
  - Vegetectomy + valve repair

Non fist-line options:
  - Valve replacement
  - Temporarily valvectomy, with valve replacement only after cure of infection
RIGHT- SIDED ENDOCARDITIS

2. HEALTH-CARE ASSOCIATED

The "bad" guy....
HEALTH CARE ASSOCIATED
RIGHT-SIDED ENDOCARDITIS

- Permanent pace-makers, implantable cardioverter defibrillators, central venous catheters, dialysis…
- **Severe disease, high mortality**
- 1.9/1000 devices per year
HEALTH CARE ASSOCIATED RIGHT- SIDED ENDOCARDITIS

- 0, 13 – 7% implantations

- **Staphylococcus**

- Early (< 1 year)/ Late

- Difficult diagnosis – **TEE** (< sensiv, < specific)

DD thrombus, calcium

Reverberations, artifacts
HEALTH CARE ASSOCIATED
RIGHT- SIDED ENDOCARDITIS

Important difficult distinction

Local device infection
infection of the pocket of the device, with local inflammation

vs

Cardiac device related endocarditis
Infection extending to electrode leads/cathether tip, valve leaflets
HEALTH CARE ASSOCIATED
RIGHT- SIDED ENDOCARDITIS

• Pathophysiology
  ➔ contamination at the time of implantation by local flora ➔
  spread along the electrode till the tip and endocardium with
  vegetation in the electrode/catheter, valves and RA and RV
  endocardium
Other: haematogeneous seeding from a distant focus of infection

High risk of cardiac device endocarditis
- Fever 24h before implantation
- Temporary pacing before
- Early reimplantation
HEALTH CARE ASSOCIATED
RIGHT- SIDED ENDOCARDITIS

• Diagnosis

ONE OF THE MOST DIFFICULT FORMS OF IE TO DIAGNOSE!!!!

Misleading clinical presentation, respiratory or reumathological symptoms, particularly in the elderly

Unexplained fever in a p with a cardiac device

⇒ exclusion of device IE
HEALTH CARE ASSOCIATED
RIGHT- SIDED ENDOCARDITIS

• Diagnosis
  Blood cultures ➔ *Stap* is the most common agent

ECHOCARDIOGRAPHY
Always TTE and TEE
False negatives frequent ➔ normal TTE and TEE does not rule out

Modified Duke criteria ➔ new major criteria in device IE
- local signs of infection
- Pulmonary embolism

Klug, Circulation 1997
HEALTH CARE ASSOCIATED
RIGHT- SIDED ENDOCARDITIS

Treatment

1- **Prolonged** 4-6 weeks
   individualized **antibiotic treatment**

2- **ALWAYS** device and lead extraction
   **Percutaneously** method of choice
despite the high risk of pulmonary embolism, frequently asymptomatic

**Surgical** only when percutaneous not possible (years) or very very large vegetations (>25mm)
Reimplantation “golden rules”

1. Reassess the necessity of reimplantation
2. Temporary pacing no!!! Infection.....
3. If needed, in the contralateral side, with prophylaxis, ideally when infection is controled
4. Epicardial implantation if dependent ➔ immediate implantation needed
FEMALE, 52, COLON CANCER, QT INFECTED QT CATHETER + LEGIONELLA & LISTERIA SEPSIS

Stroke (cerebral abscess)
SVC CATHETER ENDOCARDITIS+PFO+PARADOXICAL EMBOLISM
RIGHT SIDED ENDOCARDITIS
CONCLUSIONS-TAKE HOME MESSAGES

BETWEEN IV DRUG ABUSE AND
HEALTH CARE ASSOCIATED

1-it is not a single disease but two different diseases with different epidemiology, pathology, pathophysiology, clinical features, diagnosis, treatment and prognosis

1. IV DRUG ABUSE
2. HEALTH- CARE ASSOCIATED
RIGHT SIDED ENDOCARDITIS
CONCLUSIONS-TAKE HOME MESSAGES

IV DRUG ABUSE
Usually the good guy
Usually easy to diagnosis
Usually TTE
Usually medical treatment
Usually good prognosis
RIGHT SIDED ENDOCARDITIS
CONCLUSIONS-TAKE HOME MESSAGES

HEALTH- CARE ASSOCIATED

Usually the bad guy
Usually difficult to diagnosis
Usually TEE
Usually medical treatment + lead extraction
Usually less good prognosis
BE CAREFUL
THIS MACHINE HAS NO BRAIN
USE YOUR OWN
Come and visit us

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Become one of us!

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