

The Changing Face of Infective Endocarditis (IE)
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Sugarloaf Winter Symposium 2018

The Background

- Pick whatever statistic you like, they are staggering
 - 91 Americans die every day from opioid abuse
 - 770,000 IV drug users in USA in 2017
 - Heroin is cheaper than a pack of cigarettes in many states
- IV drug use is on the rise, along with those diseases which occur from IVDU (osteomyelitis, endocarditis, skin and soft tissue infections, etc).
- Until we can turn the tide of the opiate wave, we must help and treat the morbid diseases that occur from IVDU (osteomyelitis, endocarditis, skin and soft tissue infections, etc).
- A contemporary understanding of the epidemiology of IE and its association with IVDU is vital to adequate detection and treatment

Changing Face of IE

- Increasing IVDU is changing the demographic and clinical factors of endocarditis
 - Demographic factors among IVDU endocarditis are making it harder to detect and treat
 - More homelessness
 - More incarceration
 - Increase in underinsured/uninsured
 - Higher rates of refusing medical advice
 - High recurrence rate due to medical non-compliance and continuing IVDU
 - Difficulty with lifelong anticoagulation for bio prosthetic valves due to noncompliance
 - Increase in IVDU means an increase in right sided endocarditis
 - Numerous pathophysiological mechanisms proposed
 - Impure ingredients
 - Nonsterile solvents (saliva, toilet water)
 - Licking of needle
 - Cocaine and amphetamines
 - Poor skin prep
 - Higher rates of MRSA colonization

The Difficulty with Right Sided Endocarditis

- Murmurs are frequently inaudible (45%)
- Peripheral embolic phenomena rare
- Duke Criteria sensitivity weakened

- Embolic phenomena (e.g. Osler's nodes, Roth spots, etc.) represent minor criteria in modified Duke system, but are less commonly found in right sided IE
- Right sided endocarditis have less embolic clues
 - While left sided IE can embolize to the brain, eyes, kidney, spine, joints, etc., right sided IE embolizes only to the lung leaving less embolic clues

You should worry about your IVDU patients with a fever

- Be careful of system 1 thinking in your IVDU patients, especially those with a fever (Not just another flu patient!)
- Studies show 5-13% of ED IVDU patients with a fever have infective endocarditis

How do we catch these cases of IE?

- Start with a solid history and physical exam
 - Listen very carefully for a murmur (but do not depend upon it)
 - Look for hematuria, splenomegaly
 - Examine your patients for embolic phenomena (Roth spots, Janeway Lesions, splinter hemorrhages, Osler nodes)
 - Consider risk factors such as IV drug use, recent instrumentation or procedures, indwelling lines, hemodialysis, history of rheumatic heart disease, or degenerative valvular problems.
 - Screen for signs and symptoms of IE in IVDU patients who present with other complaints (skin and soft tissue infections, overdose, etc)
- Pick off the low hanging fruit
 - Fever and stroke → IE until proven otherwise
 - Multiple sites of infection → IE until proven otherwise
 - IVDU plus bacteremic infections (e.g. spinal infections) → IE until proven otherwise
- Scrutinize the lungs – they are your “window to the heart”
 - 50% of right sided IVDU have evidence of septic pulmonary emboli
 - Scrutinize the chest xray for signs of pneumonia, multifocal pneumonia, cavitory lesions, empyema, effusion
 - Multiple cavitory lesions should be assumed to be secondary to IVDU until proven otherwise
 - Have a low threshold for a CT chest

How do I diagnose IE?

- Would be nice to have an ED decision instrument that can reliably determine which febrile IVDUs have IE; this would lead to considerable resource savings over the current practice of routine admission
- Unfortunately there are not good ED protocols to decide who to admit
- The diagnosis of IE is based on clinical, microbiologic and echocardiographic findings

- There are numerous tests one could order that can increase or decrease your suspicion of the disease (CBC, CRP, ESR, BNP, EKG, etc) but the cornerstone tests are the blood cultures and formal echocardiography
 - Blood cultures
 - Have a low threshold to order blood cultures in the patient you suspect IE (even without a fever!)
 - Numerous societies have differing recommendations on blood cultures
 - At minimum, get 3 blood cultures from 3 different sites, with an hour between the first and third blood culture
 - 3 cultures has consistently been shown to be > 90% sensitive
 - Beware the SLUG!
 - Staphylococcus lugdensis, a coag neg staph, should not be considered a contaminant and false positive
 - SLUG in patients with valvular disease is endocarditis until proven otherwise
 - Point of Care Ultrasound can help rule in IE but certainly does not rule it out – if concerned, admit for cultures, formal echocardiography

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