When is the flu not the flu?

Dr. Kirsten Jewell CCFP(EM)

Huntsville District Memorial Hospital Grand Rounds

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Objectives

1. Recognize the clinical features and risk factors of infective endocarditis
2. Identify diagnostic approaches for suspected endocarditis in patients presenting with flu-like symptoms
3. Differentiate flu-like symptoms from other potentially life-threatening conditions

case

- 54 M
- Triage complaint: weakness/generally unwell
- 10 days ‘fever’ & chills, fatigue, leg weakness and bilateral thigh pain, low back ache, headache
- mild SOBOE, no productive cough
- No PMH, no meds
- Works in construction, married, no recent travel, nonsmoker, no IVDU

- Vitals: T 37.9 HR 103 RR 20 BP 150/84 SpO2 96%

DDx?

- Flu
- COVID
- Viral illness
- …
- …
- Endocarditis?

Table 34.3. The Modified Duke Criteria for the Diagnosis of Endocarditis

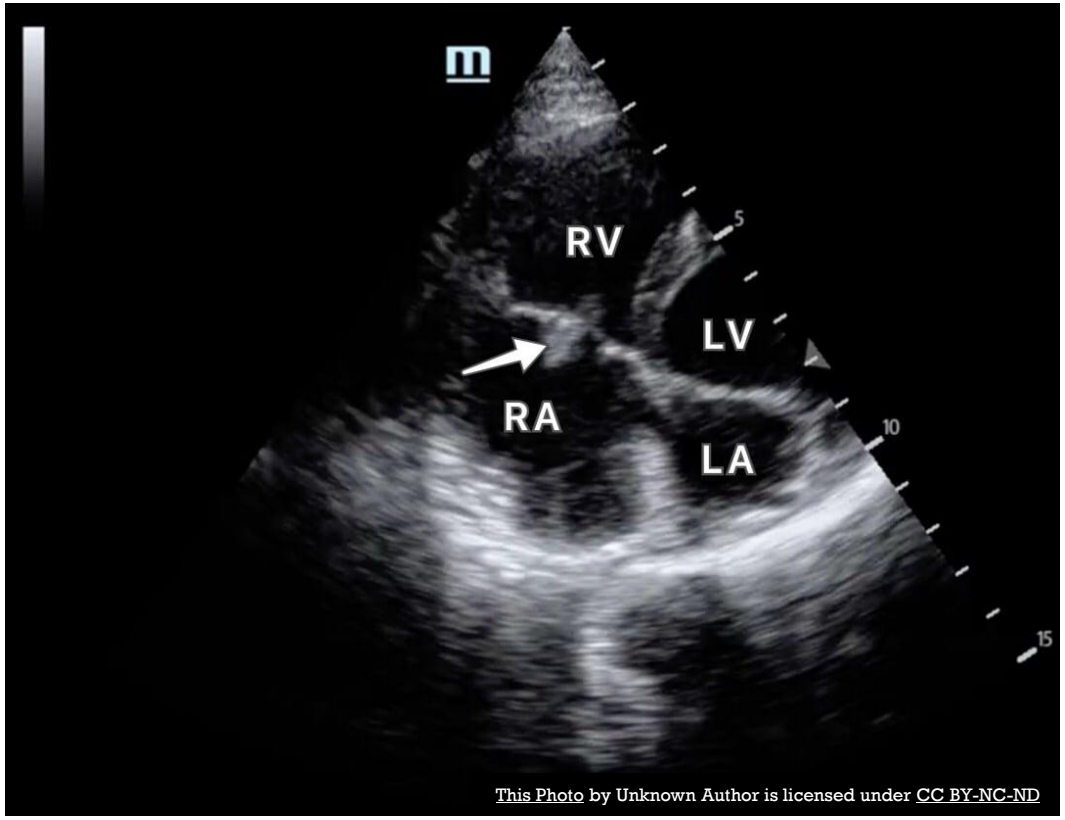
Major Criteria

- Blood culture positive for IE
  - Typical microorganisms consistent with IE from two separate blood cultures
    - Viridans streptococci; *Streptococcus bovis*, HACEK group, *Staphylococcus aureus*; or
    - Community-acquired enterococci, in the absence of a primary focus
  - Microorganisms consistent with IE from persistently positive blood cultures, defined as follows:
    - At least two positive blood cultures of blood samples drawn >12 h apart; or
    - All of three or a majority of ≥4 separate cultures of blood (with first and last sample drawn at least 1 h apart)
  - Single positive blood culture for *Coxiella burnetii* or antiphase I IgG antibody titer >1:800
- Evidence of endocardial involvement
- Echocardiogram positive for IE (TEE recommended in patients with prosthetic valves, rated at least "possible IE" by clinical criteria, or complicated IE [paravalvular abscess]; TTE as first test in other patients), defined as follows:
  - Oscillating intracardiac mass on valve or supporting structures, in the path of regurgitant jets, or on implanted material in the absence of an alternative anatomic explanation; or
  - Abscess; or
  - New partial dehiscence of prosthetic valve
- New valvular regurgitation (worsening or changing or preexisting murmur not sufficient)

Minor Criteria

- Predisposition, predisposing heart condition or injection drug use
- Fever, temperature >38°C
- Vascular phenomena, major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, and Janeway lesions
- Immunologic phenomena: Glomerulonephritis, Osler nodes, Roth's spots, and rheumatoid factor
- Microbiological evidence: Positive blood culture but does not meet a major criterion as noted previously (excluding single positive cultures for coagulase-negative staphylococci and organisms that do not cause endocarditis) or serologic evidence of active infection with organisms consistent with IE
- Echocardiographic minor criteria eliminated

IE, Infective endocarditis; *TEE*, transesophageal echocardiography, *TTE*, transthoracic echocardiography.
Modified from Li, J. S., Sexton, D. J., Mick, N., Nettles, R., Fowler, V. G., Ryan, T., et al. (2000). Proposed modifications to the Duke criteria for the diagnosis of infective endocarditis. Clinical Infectious Diseases, 30(4), 633–638.



Infective Endocarditis

IE

- 3 to 9 cases per 100,000 persons in industrialized countries in 2013, 15 in 100,000 in the US
- male:female case ratio is more than 2:1
- Median age >70
- 6 month mortality of ~25%

Patient Clues

- IVDU
- Prosthetic Valve
- Rheumatic heart disease
- Unrepaired cyanotic CHD
- Bad dentition/recent dental work
- Recent instrumentation or procedures, indwelling lines/HD catheter

Patient Clues

- Lupus
- End-stage Cancer

Clinical Clues

- FEVER (80-96%)
- FEVER "PLUS" …
  - Murmur (85%)
  - Back pain
  - Stroke
  - Rhythm changes
  - CHF

Exam Question

- **What are the classic physical exam findings in Infectious Endocarditis?**

Roth Spots

Osler’s nodes & Janeway lesions

C

Oslers’ nodes
Tender, s/c nodules

D

Janeway lesions:

Nontender erythematous, haemorrhagic, or pustular lesions often on palms or soles.

Splinter Hemorrhages

Workup

- Blood cultures x 3 OR MORE
- Labs
- Echo

Blood cultures

- *Staphylococcus*
  - Staph aureus *most common, worse prognosis, most likely to embolize
- *Streptococcus*
  - Strep viridans, Strep bovis
- Coag neg *staphylococcus* – 82% are contaminants
  - *BUT* 2nd most common cause of IE in pt with prosthetic valve
  - *Staph lugdunesis* (Slug) can cause IE even in native valve
- *Enterococcus faecalis* with no source of infection found

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Treatment

- No rush on antibiotics: wait on cultures?
- Empiric:
  - Native valve: Vanco + CTX (Cefazolin or Pip-Tazo if IVDU)
  - Prosthetic valve: Vanco + Pip-Tazo + Gent
  - Consider adding Rifampin if new prosthetic valve + staph, but add only after blood cultures have cleared
- 4 weeks IV antibiotics (range 2-6 weeks)
  - Time starts when repeat blood cultures turn NEGATIVE
  - Guided by ID!
- Surgery? 25% of patients will require Surgery!
  - Aortic Valve IE
  - Acute CHF/severe regurg
  - Call Southlake Cardiology!

Prophylaxis

- Patient factors:
  - Prosthetic heart valves
  - Prior hx IE
  - Unrepaired cyanotic CHD
- Procedure factors:
  - Only for *invasive* dental procedure (gingival manipulation; not routine dental cleaning)
- Amoxicillin 2g (50mg/kg) PO x 1 dose
- Azithromycin 500mg PO x 1 dose OR Doxy 100mg x 1
  - 30-60min prior to procedure

Working backwards

- ← +blood cultures with staph aureus or strep viridans/bovis
- staph aureus in urine or other sites
- osteomyelitis of spine or spinal epidural abscess
- any stroke patient with fever (embolic pattern, often MCA)
- infection in multiple simultaneous sites … pneumonia plus perinephric abscess; consider with *multilobar pneumonia* as well

case

- 35 year old M
- Triage complaint: decreased LOC
- EMS found in his trailer laying on couch, in vomit, disheveled. Trailer was cold. Camp stove noted in kitchen, drug paraphanalia. More alert now than on presentation. Pupils constricted, no focal deficits. Complaining of headache, nausea, shortness of breath. Partner says he returned from trip to Peru 2 weeks ago. Has had myalgias, fatigue and ?fever/chills since then.
- Vitals: T 35.0 HR 110 RR 28 BP 110/60 SpO2 95%

DDx?

- Flu
- COVID
- Viral illness
- Endocarditis
- Malaria
- Meningitis/Encephalitis
- Carbon Monoxide poisoning

CO toxicity

- Most common symptoms: headache (58%), nausea (33%), Dizziness (29%)
- History is key! Exposures? Household members/pets?
- Dx: COHb level on VBG:
  - >3% (non-smokers)
  - >10% (smokers)
- Tx: High Flow Oxygen
  - Decreases half-life from about 5h to 1.5 hrs
  - Consider Hyperbaric Oxygen…

Malaria

- Generally symptoms appear 1 month after exposure
  - Fever and flu-like illness (cyclic fever, often >40deg)
  - Chills
  - Headache, muscle aches, and tiredness
  - Nausea, vomiting, and diarrhea
  - Labs: Anemia, thrombocytopenia, hyperbilirubinemia, elevated AST/ALT, BUN, Cr…
- Dx: Thick and Thin Smear repeated q8h x 2 days!
- DDx: Dengue fever, Chikungunya, Leptospirosis…

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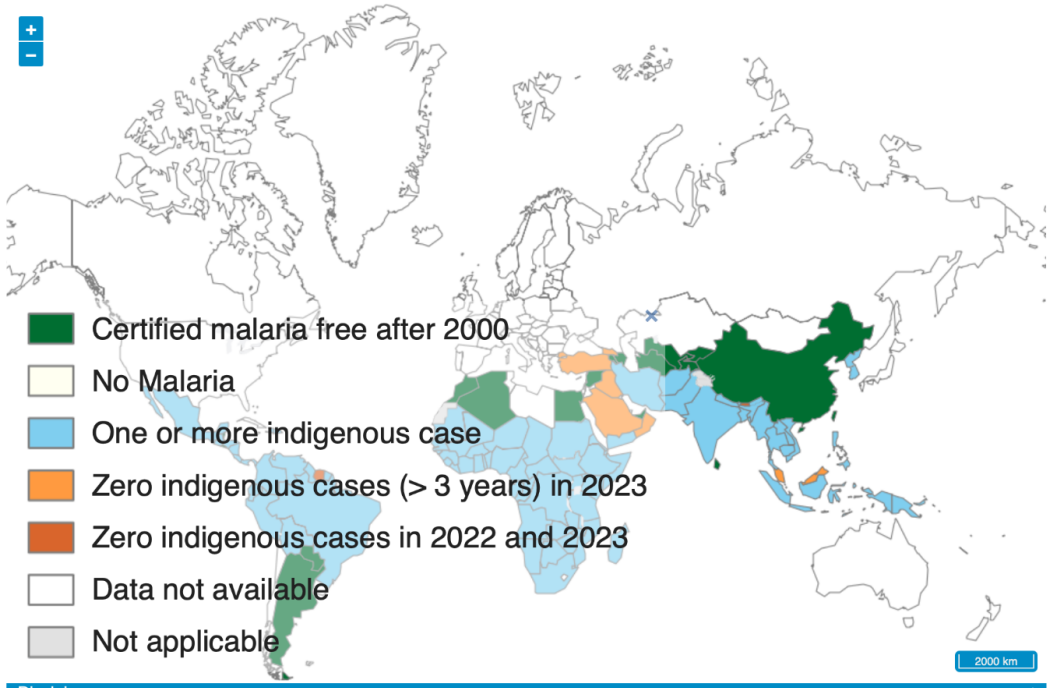
Status of indigenous malaria cases

FILTERS

Year

2023



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World Health Organization

Stop and Think: Is this the needle in the haystack?

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