AN ATYPICAL PRESENTATION OF RIGHT-SIDED NATIVE VALVE ENDOCARDITIS

1. Review the evidence for HACEK-associated infective endocarditis management
2. Understand the various microbiologic properties of Haemophilus influenza
3. Appreciate the difference in virulence and clinical manifestations of various Haemophilus species

Case

ID: 55-year-old male with 10 days of progressive dyspnea

History:
- Review of systems positive for fever, night sweats, headache, myalgias and productive cough with yellow sputum
- No significant past medical history, medications or allergies
- Lives in an urban center with no occupational or animal exposures
- Denies prior smoking, alcohol use, and recreational drug use
- Travelled to New Orleans one month ago with partner who developed similar symptoms three weeks previously but improved with conservative management

Physical exam:
- Non-distressed with normal vital signs and O2 saturation of 94% on room air
- No lymphadenopathy, splinter hemorrhages, Osler nodes or Janeway lesions
- Systolic murmur best heard at left lower sternal border during inspiration
- JVP elevated with bilateral pretibial pitting edema
- Respiratory and gastrointestinal exam unremarkable

Investigations:
- White blood cell count 15.2 x 10^9/L
- Neutrophil count 14.2 x 10^9/L
- Creatinine and electrolytes - normal
- Chest X Ray - normal
- Nasopharyngeal swab – negative for respiratory viruses
- Transthoracic echocardiogram - severe tricuspid regurgitation (TR)
- Transesophageal echocardiogram - small mobile vegetation on atrial aspect of tricuspid valve with severe TR and a flail anterior leaflet
- Blood cultures – 2/2 bottles positive for H. influenzae (non-typeable)

Management:
- Ceftriaxone 2g IV daily for four weeks
- Tolerated therapy well with no evidence of heart failure and no surgical intervention was required

Discussion

Atypical Presentation:
- This patient exhibited respiratory symptoms without classic risk factors for infective endocarditis (IE), such as intravenous drug use, valvular disease or prior IE.
- Most IE cases caused by Staphylococcus aureus, viridans group Streptococci, and Enterococci.
- H. influenzae is predominantly a respiratory pathogen.
- H. parainfluenzae and A. aphrophilus (formerly Haemophilus) are more virulent organisms which are more commonly associated with IE.
- Important to consider uncommon organisms with atypical presentation in patients with IE.

Microbiology considerations:
- HACEK organisms (Haemophilus, Aggregatibacter, Cardiobacterium, Eikenella, and Kingella) are responsible for 5-10% of community-acquired cases of native valve endocarditis (NVE) not involving injection drug use.
- These fastidious organisms previously required extended incubation periods to grow.
- H. influenzae requires both factor V (NAD) and factor X (hemin), whereas other Haemophilus species require either factor V, factor X, or neither.
- Staph streak technique allows satellite growth of H. influenzae in regions where S. aureus is streaked on blood agar due to factor V release (Figure 1).

Management strategy:
- It is difficult to get antimicrobial susceptibility due to challenges growing in a laboratory setting.
- There is resistance to penicillin and ampicillin due to beta-lactamase production.
- Empiric treatment of HACEK-associated NVE is ceftriaxone 2 g IV daily for four weeks as per AHA/IDSA guidelines.

Figure 1. Growth of satellite colonies of Haemophilus influenzae using “Staph streak” method (Photo from Calgary Laboratory Service (CLS))

Figure 2. Haemophilus influenzae appear as pink coccobacilli on gram stain (Photo from CLS)