

Prosthetic valve endocarditis (PVE) accounts for 10-20% of cases of infective endocarditis (IE). Generally it is estimated that eventually, 5% of mechanical and bioprosthetic valves inserted may become infected. Mechanical valves are more likely to be infected within the first three months of implantation whereas bioprosthetic valves are more likely to be infected after one year of implantation. The valves in the mitral valve position are more susceptible than those in the aortic areas.

Early PVE occurs within 60 days of valve implantation. Traditionally, coagulase-negative Staphylococci, gram-negative bacilli, and *Candida* species have been the common infecting organisms. Late PVE occurs 60 days or more after valve implantation. Staphylococci, alpha-hemolytic Streptococci, and Enterococci are the common causative organisms.

The diagnosis of IE is usually based upon a constellation of clinical findings rather than a single definitive test result. In cases of suspected IE, a minimum of three blood cultures should be obtained over a time period based upon the severity of the illness. Trans-thoracic echocardiograms are a must and if still in doubt, a trans-oesophageal echocardiogram should be performed to confirm the presence of vegetation.

The Duke's Criteria remain one of the main diagnostic criteria used in IE. It is summarised below and consists of major and minor criteria.

Major Criteria:

1. Positive blood culture for IE

Typical microorganism consistent with IE from 2 separate blood cultures, as noted below:

Viridans Streptococci, *Streptococcus Bovis*, or HACEK Group, or

Community-acquired *Staphylococcus Aureus* or Enterococci, in the absence of a primary focus

or

Microorganisms consistent with IE from persistently positive blood cultures defined as:

two positive cultures of blood samples drawn >12 hours apart, or

all of three or a majority of four separate cultures of blood (with first and last sample drawn 1 hour apart)

2. Evidence of endocardial involvement

Positive echocardiogram for IE defined as:

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

or

New valvular regurgitation (worsening or changing of pre-existing murmur not sufficient)

Minor criteria:

1. Predisposition: predisposing heart condition or intravenous drug use

2. Fever: temperature > 38.0° C (100.4° F)

3. Vascular phenomena: major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, and Janeway lesions

4. Immunologic phenomena: glomerulonephritis, Osler's nodes, Roth spots and rheumatoid factor

5. Microbiological evidence: positive blood culture but does not meet a major criterion or serological evidence of active infection with organism consistent with IE

6. Echocardiographic findings: consistent with IE but do not meet a major criterion

Clinical criteria for infective endocarditis require:

- Two major criteria, or
- One major and three minor criteria, or
- Five minor criteria

Management

Intravenous antibiotics are the mainstay in the treatment of IE. Depending on the infective organism, therapy is usually given over a 4-6 weeks period. Intermittent blood cultures may be necessary to assess the response to treatment. Concurrent treatment for heart and renal failure should also be given.

Approximately 15-25% of patients with IE eventually require surgery. Indications for surgical intervention in patients with NVE include:

- Congestive heart failure refractory to standard medical therapy
- Fungal IE (except that caused by *Histoplasma capsulatum*)
- Persistent sepsis after 72 hours of appropriate antibiotic treatment
- Recurrent septic emboli, especially after 2 weeks of antibiotic treatment
- Rupture of an aneurysm of the sinus of Valsalva
- Conduction disturbances caused by a septal abscess
- Kissing infection of the anterior mitral leaflet in patients with IE of the aortic valve
- Valvular dehiscence in PVE

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