

Infective Endocarditis and Catheter-Related Infections: Review Questions

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QUESTIONS

Choose the single best answer for each question.

- Which of the following statements regarding endocarditis in injection drug users (IDUs) is FALSE?**
 - Right-sided (tricuspid valve) endocarditis is most common.
 - IDUs with left-sided endocarditis usually have preexisting left-sided valvular disease.
 - Data support the use of short-course (2-week) therapy for right-sided endocarditis caused by methicillin-sensitive *Staphylococcus aureus* in IDUs.
 - Fungi account for approximately 5% of cases of endocarditis in IDUs.
 - Candida albicans* is the most common fungal organism causing endocarditis in IDUs.
- Which of the following is an appropriate therapeutic regimen for mitral valve endocarditis caused by enterococci (penicillin/ampicillin minimum inhibitory concentration [MIC] ≥ 1 , gentamicin/streptomycin synergy screen-sensitive)?**
 - Penicillin or ampicillin plus gentamicin or streptomycin for 2 weeks
 - Penicillin or ampicillin plus gentamicin or streptomycin for 6 weeks
 - Penicillin or ampicillin alone for 8 weeks in an elderly patient at high risk for aminoglycoside-induced nephrotoxicity
 - Ceftriaxone plus gentamicin or streptomycin for 6 weeks in a patient allergic to penicillin
 - Vancomycin alone for 6 weeks in a patient allergic to penicillin
- Which of the following statements regarding the management of native valve endocarditis caused by viridans streptococci (penicillin MIC ≤ 0.1) is TRUE?**
 - In cases complicated by congestive heart failure (CHF), valve replacement should be deferred until the blood cultures are negative, even if the CHF is refractory to medical management.
 - Valve ring abscess is not an indication for surgery if the organism is a penicillin-sensitive viridans streptococcus.
 - Penicillin plus gentamicin or streptomycin for 2 weeks or penicillin alone for 4 weeks is an acceptable therapeutic regimen.
 - Neurologic complications occur in less than 10% of cases.
 - Once-daily ceftriaxone for 4 weeks is not an accepted therapeutic regimen.
- Endocarditis prophylaxis is not recommended for which of the following cardiac conditions?**
 - Mitral valve prolapse without regurgitation
 - Hypertrophic cardiomyopathy
 - Previous episode of endocarditis
 - Degenerative valvular dysfunction
 - Ventricular septal defect
- Infective endocarditis prophylaxis is not recommended for which of the following procedures?**
 - Cystoscopy
 - Vaginal hysterectomy
 - Esophageal dilatation
 - Flexible bronchoscopy with biopsy
 - Dental cleaning
- In patients with tunneled (long-term) catheters, for which of the following organisms must catheter-related bacteremia be managed with antibiotic therapy and catheter removal?**
 - Corynebacterium jeikeium*
 - Staphylococcus epidermidis*
 - Klebsiella pneumoniae*
 - Staphylococcus aureus*
 - Escherichia coli*

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EXPLANATION OF ANSWERS

1. (E) *Candida albicans* is the most common fungal organism causing endocarditis in IDUs (FALSE).

Endocarditis is a common infectious complication of injection drug use, and endocarditis occurs in 10% to 15% of IDUs who present to urban emergency departments with fever. The tricuspid valve is involved in more than 50% of cases. *Staphylococcus aureus* is the most common bacterial etiology of endocarditis in IDUs. Several clinical trials have shown that therapy with nafcillin or oxacillin in combination with an aminoglycoside for 2 weeks is adequate for IDUs with uncomplicated right-sided disease caused by methicillin-susceptible *S. aureus*. Injection drug use is an important risk factor for fungal endocarditis. Other risk groups include patients with prosthetic valves in the postoperative period and patients with long-term intravenous catheters. In several published series, non-*albicans* *Candida* species, particularly *C. parapsilosis* and *C. tropicalis*, have predominated among IDUs with fungal endocarditis, whereas *C. albicans* has been the most common fungal pathogen in the other risk groups.

2. (B) Penicillin or ampicillin plus gentamicin or streptomycin for 6 weeks. The therapy of enterococcal endocarditis is complicated by the inherent relative resistance of this pathogen to penicillin. Therefore, the synergistic combination of high-dose penicillin or ampicillin and gentamicin or streptomycin must be used in all cases, including those involving patients at high risk for nephrotoxicity. Enterococci are resistant to all cephalosporins. In a penicillin-allergic patient, vancomycin in combination with gentamicin or streptomycin is an acceptable alternative. However, some experts would recommend penicillin desensitization. Four to 6 weeks of therapy is necessary; the 4-week course reserved for patients with symptoms of less than 3 months' duration.

3. (C) Penicillin plus gentamicin or streptomycin for 2 weeks or penicillin alone for 4 weeks is an acceptable therapeutic regimen (TRUE). Either of these regimens or once-daily ceftriaxone are acceptable therapeutic options for infection caused by sensitive (penicillin MIC of 0.1 or less) viridans streptococci. Neurologic complications are relatively common in patients with endocarditis, occurring in 20% to 40% of cases. CHF, which is refractory to medical man-

agement, and valve ring abscess are both indications for valve replacement. In refractory CHF, delaying surgery until blood cultures are negative is unnecessary.

4. (A) Mitral valve prolapse without regurgitation. Hypertrophic cardiomyopathy, a previous episode of endocarditis, degenerative valvular dysfunction, and ventricular septal defect all warrant endocarditis prophylaxis according to the American Heart Association (AHA) guidelines. A previous episode of endocarditis is considered high risk, whereas hypertrophic cardiomyopathy, degenerative valvular dysfunction, and ventricular septal defect are considered moderate risk. The issue of endocarditis prophylaxis in mitral valve prolapse has been controversial and interested readers are referred to the most recent AHA guidelines for a more detailed discussion.¹

5. (D) Flexible bronchoscopy with biopsy. The need for infective endocarditis prophylaxis for a given procedure depends on the risk that the procedure will produce a bacteremia caused by an organism commonly associated with endocarditis. This risk is considered low for flexible bronchoscopy, even with biopsy. However, in the most recently published AHA guidelines, prophylaxis is considered optional for patients with high-risk cardiac conditions who undergo flexible bronchoscopy.

6. (A) *Corynebacterium jeikeium*. Bacteremia secondary to infection of long-term catheters can be managed with antibiotic therapy and catheter salvage in many cases. Catheter removal is recommended for infection caused by several pathogens including *C. jeikeium*, *Bacillus species*, *Enterococcus*, and *Pseudomonas*. The need to remove the catheter in all cases of catheter-related fungemia is controversial. Although catheter salvage can be attempted in bacteremias caused by *S. aureus*, the relapse and complication rates are much higher than those for infections caused by coagulase-negative staphylococci.

REFERENCE

1. Dajani AS, Taubert KA, Wilson W, et al: Prevention of bacterial endocarditis. Recommendations by the American Heart Association. *JAMA* 1997;277:1794–1801.

Adapted from Brown PD: Infective endocarditis and catheter-related infections. Hospital Physician Infectious Diseases Board Review Manual 1996:2(1).