

Dialysis

Vascular Access

20. Managing infection in haemodialysis catheters

CARI Guidelines

- a. In general, presentation with tunnel infection, or bacteraemia/septicaemia will require removal of the central line and eventual re-siting, after 48-72 hours of antibiotics and being afebrile. (level C evidence)
- b. Patients with positive blood cultures for staphylococcus aureus should be treated with 2 weeks of intravenous antibiotics, or on the advice of a microbiologist. (level B evidence)
- c. Avoidance of excessive use of vancomycin for empirical treatment of infections, other than in recognised NMRSA or MRSA carriers is advised due to the risk of vancomycin resistance. (level B evidence)

Practice Tips

- Exit site infection, tunnel infections and bacteraemia/septicaemia are all complications of invasive foreign body.
- Treatment of infection requires appropriate cultures, and a decision whether the catheter needs immediate removal or, whether a period of observation with antibiotic treatment is warranted.
- Temporary access via the femoral route may be required until a further catheter can be re-sited in the central veins.
- Catheters can be replaced over a guidewire under continuous antibiotic cover provided the exit-site and tunnel are not infected. (level B).

What is the evidence?

Peacock SJ, Curtis N, Berendt AR, Bowler IC, Winearls CG, Maxwell P. Outcome following haemodialysis catheter-related Staphylococcus aureus bacteraemia. *J Hosp Infect* 1999; 41: 223-228.

Retrospective review of morbidity of staph aureus bacteraemia and importance of appropriate duration of treatment, and need for prevention.

Hoen B, Paul-Dauphin A, Hestin D, Kessler M. Epibacidal; A multicenter prospective study of risk factors for bacteremia in chronic hemodialysis patients. *J Am Soc Nephrol* 1998; 9: 869-876. (988 patients on HD followed prospectively for 6 months. Incidence of 1 episode per 100 patient months of staph sepsis, risk factors were CVC, previous history of bacteremia, immunosuppression and Hb level.)

Marr KA, Sexton DJ, Conlon PJ et al. Catheter-related Bacteremia and outcome of attempted catheter salvage in patients undergoing hemodialysis. *Ann Intern Med* 1997; 127: 275-280. (Prospective observational study in 102 patients on hemodialysis. Attempting to leave infected catheters in-situ whilst treating with antibiotics had a low success rate, but was not associated with greater risk of metastatic infection. Gram positive infections were less likely to be successful. Catheters were not exchanged over a guidewire however when fever had subsided.)

Kovalik EC, Raymond JR, Albers FA. Catheter-related sepsis complicating long-term tunnelled

central venous dialysis catheters: management by guidewire exchange. Am J Kidney Dis 1995; 25: 593-596.

What do the other guidelines say?

DOQI: Tunneled cuffed catheter infection is a serious problem. Appropriate treatment is dependent upon the nature of the infection:

Catheter exit site infections-characterized by redness, crusting, and exudate at the exit site in the absence of systemic symptoms and negative blood cultures-should be treated as follows:

1. Apply topical antibiotics, ensuring proper local exit site care; do not remove the catheter. (Opinion)
2. If there is tunnel drainage, treat with parenteral antibiotics (anti-staphylococcal, anti-streptococcal therapy pending exit site cultures) in addition to following appropriate local measures. Definitive therapy should be based on culture results. Do not remove the catheter unless the infection fails to respond to therapy. If the infection fails to respond to therapy, remove the catheter and replace it using a different tunnel and exit site. (Evidence/Opinion)

Catheter-related bacteremia, with or without systemic signs or symptoms of illness, should be treated by initiating parenteral treatment with an antibiotic(s) appropriate for the organism(s) suspected, usually Staphylococcus and Streptococcus. (Evidence) Definitive therapy should be based on the organism(s) isolated. (Evidence)

1. The catheter should be removed in all instances if the patient remains symptomatic more than 36 hours. (Evidence)
2. Preliminary reports suggest that after obtaining a bactericidal level of the antibiotic in the blood, stable asymptomatic patients without exit site or catheter tunnel tract involvement may be treated by changing the catheter over a guidewire plus a minimum of 3 weeks of systemic antibiotic therapy. Blood cultures should be repeated periodically during and immediately after this treatment to monitor its effectiveness. The catheter should also be removed in any clinically unstable patient. (Opinion)
3. A new permanent access should not be placed until blood cultures, performed after cessation of antibiotic treatment, have been negative for at least 48 hours. (Opinion)

BRA: No guidelines available

CSN: In patients with cuffed or noncuffed central venous catheters and suspected bacteremias,, start treatment with cefazolin 1 to 2 g depending on patient weight, and gentamycin 1.5mg/kg postdialysis after blood cultures are drawn. In patients with known cephalosporin allergy, use vancomycin 15mg/kg instead of cefazolin. Once blood culture results are available, the catheter should be changed over a wire and antibiotic treatment continued for 2 to 4 wk as clinically indicated.