



1-Minute Pearls/Pitfalls for the Clinician

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Abstract

This article highlights key insights and potential challenges in the management of central line-associated bloodstream infections.

QUESTION 1: HOW DO YOU MANAGE PATIENTS WITH CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS?

An 82-year-old woman with a history of end stage renal disease on hemodialysis, diabetes mellitus, hypertension is referred to the hospital after blood cultures drawn at the outpatient dialysis facility showed evidence of gram-positive bacteremia. She denied any fevers, chills, cough, diarrhea or abdominal pain. Repeat blood cultures are obtained, and she was started on IV Vancomycin.

a. Is this antibiotic coverage adequate?

A: A central line-associated bloodstream infection (CLABSI) is defined as the recovery of a pathogen from a blood culture in a patient who had a central line at the time of infection or within 48 hours before the development of infection. Based on the National Healthcare Safety Network (NHSN) data, the most common pathogens associated with CLABSI are Gram-positive pathogens such as:

- Coagulase-negative *staphylococci*, *enterococci* and *Staphylococcus aureus*
- Gram-negative organisms such as *Klebsiella*, *Enterobacter*, *Pseudomonas*, *E.Coli*, *Acinetobacter*, and *candida species*

Tunneled hemodialysis catheters are prone to CRBSIs. Approximately 40%–80% of CRBSIs are caused by gram-positive organisms. Coagulase-negative *Staphylococci*, *Staphylococcus aureus*, and *Enterococcus* are the most common organisms. Methicillin-resistant staphylococcus

is frequently seen. 20%–30% of infections CRBSIs are caused by gram-negative organisms.

In addition to antibiotics, indications for long-term vascular access removal are based on clinical features and microbiological data. These include:

1. Severe sepsis and evidence of hemodynamic instability
2. Persistent bacteremia after more 72 hours of appropriate antibiotic therapy
3. Clinical evidence of metastatic infections such as meningitis, osteomyelitis, endocarditis
4. Suppurative thrombophlebitis
5. Infections due to *Staph aureus*, *Pseudomonas aeruginosa*, fungi and mycobacteria

b. Is the Empiric use of IV Vancomycin adequate in all circumstances?

A: Gram-negative coverage including coverage for *Pseudomonas aeruginosa* is required in:

1. Patients who are neutropenic
2. Patients who are colonized with resistant Gram negative bacteria
3. Patients who have or recently had femoral lines in-situ due to risk of fecal flora infection.

Use of Echinocandins to provide coverage for fungi is also required in patients who are:

1. In patients who have hematological malignancies
2. Patients on Total parenteral nutrition
3. Patients who have recently been on broad-spectrum antibiotics

4. Patients who are colonized with candida species at more than one site.

QUESTION 2: HOW LONG DO PHYSICIANS NEED TO CONTINUE PREDNISOLONE IN PATIENTS WITH ALCOHOLIC HEPATITIS?

A 36-year-old with alcohol use disorder is admitted with 3-day history of fevers, jaundice and right sided upper abdominal pain in the setting of ongoing alcohol use. Patient is diagnosed with acute alcoholic hepatitis based on his clinical presentation and laboratory data. This is a patient's third presentation with similar symptoms in the past six months. He is started on Thiamine, Folate, and CIWA protocol. He verbalizes renewed interest in medications to help address his alcohol use disorder and is therefore started on Acamprosate to help reduce his cravings for alcohol. Patient has no obvious evidence of any infection, acute kidney injury or GI bleed. Based on his MELD and GAHS (Glasgow Alcoholic Hepatitis Score) scores (being 22 and 10 respectively), he is started on Prednisolone 40 mg daily for management of his alcoholic hepatitis, with a plan to obtain a Lille score on day 7.

On the fourth day of his admission, he is afebrile, tolerating oral medications and diet well and not scoring on CIWA. He informs the medical team that he has a family emergency, and he needs to go home. He's willing to continue with Acamprosate and any other medications needed. Does he need to stay in the hospital or go home on Prednisolone for additional 3 days and then based on his Lille score either continue or stop the Prednisolone?

A: The Lille score which is based on Age, serum bilirubin, creatinine, albumin and PT is calculated on day 7 of taking Prednisolone to assess for evidence of its beneficial effects and the need to continue the recommended 28-day course to reduce the mortality of alcoholic hepatitis.

The major contraindications to use of Prednisolone in this subset of patients include:

1. Active systemic infections
2. Uncontrolled GI bleed
3. Acute kidney injury
4. Hepatic encephalopathy
5. Multi-organ failure

Patients with alcoholic hepatitis are prone to infections. Since the clinical features of alcoholic hepatitis are due to cytokine storm and consistent with systemic inflammatory response syndrome, it is imperative for infections to be excluded before committing these patients to a course of steroids. N-acetylcysteine is an antioxidant which replenishes glutathione stores in hepatocytes. Its addition to prednisolone has been shown to be synergistic in the management of patients with severe alcoholic hepatitis. This is recommended in patients with MELD score >20.

Recent data indicates the Lille Score on day 4 provides adequate prognostic information. Patients with scores <0.45 on day 4 are deemed to be suitable candidates for the 28-day regimen to attain the desired mortality benefits. For this patient, the Lille score should be obtained on day 4, and if it is <0.45 he can continue with the required 28-day course of Prednisolone. The utility of Lille score on day 4 is important to note especially in patients who may have uncontrolled hyperglycemia, encephalopathy or other major side-effects due to use of steroids. In these cases, obtaining the score of day 4 allows for early discontinuation of Prednisolone if indicated.

The use of a course of steroids does not address all the issues needed in these patients to maintain and extend the potential short-term benefits. Measures of reduce ongoing use of alcohol through use of medications and behavior therapy, reducing exposure to other potential hepatotoxins as in hepatitis A and B vaccinations (in those who are not immune), and augmenting patients' nutritional status are of utmost importance.^{1,2}

Disclosures/Conflicts of Interest

The author has no conflicts of interest to disclose

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