Executive Summary

Fungemia is responsible for significant morbidity and mortality in select patient populations. This necessitates the timely institution of optimal management by clinicians with expertise in such therapy. Duke University Hospital (DUH) ASET is seeking approval for automatic Infectious Diseases (ID) consultation for inpatients with a current diagnosis of fungemia.

A daily electronic query of microbiology results will be used to identify eligible patients. A procedure is described to contact the primary care team and facilitate formal ID consultation request.

Background

Invasive fungal infections are responsible for an increasing amount of morbidity and mortality in hospitalized patients. This expanding population is a likely consequence of advances in medical and surgical therapies. Those at highest risk of fungal infection include transplant recipients (hematopoietic and solid organ), receipt of new chemotherapeutic agents, neutropenic patients, those with other immunocompromising conditions, and patients with critical illness. (1-3) Fungemia can be a complication of invasive devices (such as intravascular lines).

The majority of cases of fungemia are cause by Candida spp. (4) In fact, candidemia is the fourth most common hospital-acquired bloodstream infection in the United States. (5, 6) Estimates of attributable mortality due to candidemia range from 15-47%. (4, 7, 8) Candidemia adds approximately 3 weeks of additional hospitalization per case, at an estimated cost of $40,000 per episode. Other fungal species that cause bloodstream infection are also associated with significant mortality and treatment costs. (1, 9, 10)

Prompt, appropriate antimicrobial therapy is paramount to improve treatment outcomes in patients with fungemia. (8) For example, patients with candidemia who receive appropriate therapy have 50% less mortality than patients with candidemia who fail to receive appropriate therapy. (8) Appropriate treatment of fungemia is complex due the need for timely establishment of a diagnosis, indwelling device and catheter removal, need for additional medical and surgical specialty interventions, and consideration both species- and patient population-specific factors. The increasing number of non-albicans Candida spp. and azole-resistant C. glabrata isolated in patients at Duke University Hospital further reduce the likelihood of initiation of appropriate initial therapy. (11) Guideline-concordant therapy and removal of central venous catheters are necessary to improve the likelihood for a good patient outcome. (12, 13)

The benefits of ID consultation have been established for other complex bloodstream infections, notably S. aureus bacteremia. (14-18) Similarly, ID consultation leads to improved outcomes of patients with
candidemia. For example, one observational study reported that patients with candidemia who received an ID consultation had a lower mortality compared with those that did not (18% vs. 39%, p=0.0083). More recently, researchers from an academic medical center performed a quasi-experimental study evaluating the benefit of a candidemia care bundle. Patients whose care was guided by the care bundle were more likely to receive ophthalmologic examination (p=0.01), receive an appropriate duration of antifungal therapy (p=0.001), and were more likely to receive appropriate antifungal therapy (p=0.05).

The proposed policy is intended to improve the management of patients with fungemia who are admitted to Duke University Hospital. In addition to the existing protocol that requires ID consult approval for selected antifungals, this protocol will allow for earlier and more complete capture of patients with growth of fungi from blood specimens.

Protocol

I. Population
   a. All inpatients at DUH (adult and pediatric) with a positive blood culture for fungus OR who require antifungal therapy for fungemia diagnosed at an outside hospital
   b. Exceptions
      i. Any patient that is already being followed by an ID consult team
      ii. Patients with documented hospice or palliative care goals that do not include antiinfectives

II. Procedures
   a. Duke University Hospital Clinical Microbiology Laboratory will use standard culture and organism identification methods to identify the presence of fungus in a blood culture
   b. On Weekdays (Monday through Friday):
      i. A query on the Reporting Workbench will be run in real-time for review by ASET personnel once daily to identify all blood cultures that are positive for fungi
      ii. When a new patient with a blood culture positive for fungi is identified, ASET personnel will contact the responsible primary physician and inform them that an automatic consult for the ID consult service is required
      iii. ASET personnel will also notify the appropriate ID fellow of the pending consult
      iv. The primary physician will page the appropriate ID fellow (adult, pediatric, or transplant) to discuss the case, place the consult request into MaestroCare, and call to request the consultation
   c. On Weekends (Saturday and Sunday)
      i. Microbiology laboratory will complete plate rounds and then text page the adult ID fellow (970-GERM) to notify them of any new first positive fungal blood culture results
      ii. The adult ID fellow will contact the pediatric ID team if required
      iii. The ID fellow is responsible for contacting the appropriate primary team to facilitate the initiation of the consult
iv. The primary team is responsible for placing the consult request into MaestroCare

d. The ID consult team will perform the consultation, continue to follow the patient’s course, provide additional recommendations if required, and arrange for post-hospitalization follow-up if deemed necessary

III. Review of Interventions

a. ASET will perform a regular review of patient outcomes following implementation of the policy and will report outcomes to the P&T committee on an annual basis

References


