Fever and the Rational Use of Antimicrobials in the Emergency Department

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KEYWORDS

• Fever • Antibiotics • Antivirals • Antifungals • Antimicrobial resistance
• Hospital-acquired infections

KEY POINTS

- Emergency physicians must balance public health concerns about increasing antimicrobial resistance with the need for early antimicrobial therapy in febrile, ill patients.
- Institutional antibiograms should help guide antibiotic choices.
- Antimicrobial choices are affected by factors such as cost, dosing frequency, side effects, administration route, and infusion properties.
- Empiric antimicrobial therapy is challenging and ever-changing; it is the responsibility of the emergency physician to remain up to date.

INTRODUCTION

According to the 2009 National Hospital Ambulatory Medical Survey, 5.6% of patients who sought treatment in emergency departments (EDs) were febrile at the time of presentation. Second only to abdominal pain and cramps, fever was the second most common chief complaint for patients who came to EDs that year, and the most common chief complaint of patients younger than 15 years. The presence of fever prompts the question of whether antimicrobials should be administered empirically. The survey data also indicate that antimicrobials were the most prescribed drug category, second only to analgesics.[1] In EDs around the United States, 7% to 8% of visits involve the administration of at least 1 antimicrobial.[2]

Antimicrobials are ordered in the ED every day. Sometimes the indication is straightforward and the choices are simple; at other times the decisions are more

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difficult. Any patient presenting with fever triggers consideration of the administration of an antimicrobial. Frequently, the decision to initiate empiric treatment needs to be made before the definitive diagnosis is known. In such cases, an organized approach is helpful.[3–5]

Determining the cause of a fever and subsequently treating it appropriately depend on multiple factors. Ideally each patient enters the ED with a clear history, and classic physical examination findings and the results of diagnostic tests mark an obvious path. However, a thorough history and physical examination can be hindered by uncontrollable elements, such as altered mental status. Results of diagnostic tests can be equivocal or even false. Therefore, empiric antimicrobial therapy has become a cornerstone of treatment. How does the emergency physician balance responsible stewardship of health resources with the need to provide effective treatment promptly?

The goal of this review is to provide a systems-based approach to prescribing antimicrobials to patients presenting to the ED with fever, while understanding the risk associated with overutilization. It seeks to provide an understanding of the key considerations needed to ensure that decisions are made well and appropriate treatment begins promptly.

GENERAL CONSIDERATIONS

When Should Antimicrobials be Used Empirically?

Not uncommonly, a physician decides that antimicrobials are needed even though a definitive infectious diagnosis has not yet been established. In these cases, "empiric therapy" is initiated, targeting potential sources of infection deemed likely and serious.[6] The spectrum of coverage is guided by a preliminary impression of probable infectious site based on the history and physical examination, relevant demographic information, medical history, laboratory data, and results of diagnostic imaging. Therefore, a good understanding of the surrounding epidemiology is particularly important. Many hospitals routinely gather culture results and sensitivity data for analysis and construction of a hospital antibiogram that provides antibiotic recommendations linked to specific clinical scenarios. This information is particularly useful for emergency service providers and others who see patients early in the course of illness, before cases have been definitively differentiated.

The need to administer antibiotics early and empirically is particularly pressing in the setting of severe infectious illnesses, including sepsis, pneumonia, and meningitis. Although some controversies remain, it is well established that antibiotics need to be administered empirically and early in selected cases, based on clinical judgment.[2] A particularly well-known illustration is found in the work of Emanuel Rivers and others, in which the strategy known as early goal-directed therapy[5] showed a significant positive impact on outcomes among patients with septic shock.[6] The 2012 Surviving Sepsis Guidelines emphasize administration of effective antimicrobials within the first hour after recognition of severe sepsis or septic shock.[7]

Assessing Vulnerability of the Patient

Comorbid conditions

The decision to prescribe antimicrobials can be informed by a thorough assessment of variables related to the host.[8] Some patients are unable to tolerate certain treatments because of hypersensitivity reactions. Patients might report a history of "allergy" in the past, even though no true allergy exists. It is important to investigate whether a history of intolerance is based on a true allergy or a less serious problem; for example, a