

Rapid Diagnostic Tests and Antibiotic Prescribing

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Inappropriate antibiotic prescribing has been associated with increasing rates of antibiotic resistance worldwide [1]. The concerning increase in resistance has not gone unnoticed. The World Health Organization (WHO) has highlighted the issue of antibiotic resistance as an important public health problem that calls for swift countermeasures [1]. There is no question that inappropriate prescribing is one of the primary factors contributing to the spread of antibiotic resistance. Multiple studies from varying regions have illustrated a strong and consistent correlation between antibiotic use and antibiotic resistance [2].

Physicians have been the target of a number of various interventions attempting to address the issue of inappropriate prescribing [1]. In 2010, the Centers for Disease Control and Prevention launched a campaign called Get Smart for Healthcare, which focused on improving antibiotic use in various healthcare settings. Acute-care facilities, long-term care facilities or any variety of inpatient setting are the most commonly targeted institutions that implement an antibiotic stewardship program [3]. Despite these attempts, excessive and inappropriate use of antibiotics is still common. It has been estimated that almost half of all children with an upper respiratory tract infection receive antibiotics regardless of lack of effectiveness in this setting [2]. Several factors are responsible for the misuse of antibiotics in the outpatient setting. Some of these include inadequate knowledge by patients and physicians alike, real or perceived pressure by the patient or parent, inappropriate communication between the patient and provider, and physician fear, experience, and education [2].

Rapid diagnostic tests (RDTs) may provide some benefit in decreasing the amount of inappropriate prescribing. Some of the benefits provided include shortening the time of a test result and screening for various infectious diseases in an outpatient setting. These tests are designed to be used directly at the site of patient care such as a physician office, outpatient clinic, and patients' homes [4]. The decrease in the amount of time to analyze a result compared to standard microbiological procedures benefits the management of infectious diseases considerably [4]. Immediate identification of a potential infecting organism can not only help decide whether or not to initiate an antibiotic, but also can help direct therapy at the infecting pathogen. Additionally, the rapid diagnosis of viral infections such as influenza can reduce the prescription of antibacterial therapy and the need for additional testing [2]. Some of the most commonly used RDTs for group A strep and influenza can provide the most benefit in terms of reducing inappropriate antibiotic prescribing.

Sore throat is a common reason parents schedule appointments with pediatricians and primary-care providers for their children. Most cases of sore throat are of viral origin and do not require antibiotic therapy [5]. The group A streptococcal rapid test is an enzyme immunoassay test that requires a pharyngeal swab to collect a specimen. This test has a sensitivity of 53-99% and a specificity of 62-100% [6]. The excellent specificity this test demonstrates, frequently higher than 95%, allows for treatment to be started immediately in the case of a positive test result [6]. It appears that the availability of these tests has led to a reduction in antibiotic prescriptions compared with the period before their implementation, leading to the prevention of emerging

antibiotic resistance [7]. The 2012 IDSA Guidelines for the diagnosis and management of Group A Streptococcal pharyngitis recommend that swabbing of the throat and testing by a rapid antigen detection test or a culture should be performed to establish a diagnosis [2]. Clinical features alone are unable to distinguish between Group A Strep and viral pharyngitis except when specific viral features such as rhinorrhea, cough, and/or hoarseness are present. In children and adolescents, a negative rapid diagnostic test result should be confirmed by a throat culture; however, no evidence exists to support this practice in adult patients. Additionally, positive rapid diagnostic test results do not require a confirmatory culture because the tests are highly specific [8].

Allowing clinicians to use diagnostic tools directly has demonstrated significant benefits for a variety of infectious diseases [4]. Concurrently, improved diagnosis and faster availability of results may lead to better clinical outcomes and more appropriate antibiotic usage. The impact of rapid diagnostic tests in clinical practice will increase in the coming years, especially in managing pathogens that are currently poorly detected with standard approaches [4]. Further changes and developments in point-of-care tests may eventually lead to new diagnostic techniques such as panel testing which is capable of testing all possible pathogens suspected in a particular patient scenario.

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