

Appropriate Diagnosis and Use of Antimicrobial Therapy in Treating Upper Respiratory Infections

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Upper respiratory infections, both viral and bacterial, contribute to a large portion of primary care physician visits. More than 30% of US pediatric visits result from upper respiratory infections,¹ accounting for some 50% to 60% of all outpatient antibiotic prescriptions.^{2,3} In addition, infections of the pharynx and tonsils are the most common pediatric illnesses after the common cold and otitis media. Many of these patients prove to have viral infections, but for those suffering from confirmed or suspected bacterial infections, clinicians must carefully choose the appropriate antibiotic therapy.

This Special Report supplement to *The American Journal of Managed Care* examines several critical issues in diagnosing and selecting the appropriate treatment for certain upper respiratory infections that are caused by bacterial agents.

While a majority of pediatric patients suffering from acute bacterial infections can be treated with oral antibiotics with no difficulty, certain conditions can limit their use, including nausea, vomiting, and refusal to take oral medications. Emily J. Chang, MD, a fellow in Pediatric Infectious Diseases at Harbor-UCLA Medical Center in Torrance, California, and S. Michael Marcy, MD, a staff pediatrician at the Kaiser Foundation Hospital in Panorama City, California, examine the role of parenteral antibiotics in such cases.

Of the parenteral therapies available, intramuscular antibiotics in such cases are an appropriate option with ceftriaxone and benzathine penicillin G (BPG), either alone or in combination with procaine penicillin G, being selected in most cases. Drs. Chang and Marcy review the advantages of intramuscular therapy, which include confirmed administration of medication, ease of single dosage, and assurance of achieving desired serum concentrations.

Next, Edward L. Kaplan, MD, of the Department of Pediatrics at the University of Minnesota Medical School in Minneapolis, and Milton Markowitz, MD, of the Department of Pediatrics at the University of Connecticut Medical School in Farmington, reexamine a large international study—with 1790 patients in 11 countries—that investigated the possible risk of allergic reactions associated with the use of intramuscular BPG for preventing recurrence of rheumatic fever.⁴ On the basis of 3000 patient years and 32,430 BPG injections, this study demonstrated that only a small proportion of patients experienced allergic reactions to intramuscular BPG and that the risk was somewhat greater among adults than among children. Most reactions, approximately 3% of total injections, were minor, and the overall rate of anaphylaxis was 0.2%. Moreover, patients ran a much greater risk of recurrence of rheumatic fever than of serious reaction to BPG.

In a report from the Acute Pharyngitis Guideline Panel of the Infectious Diseases Society of America (reprinted from *Clinical Infectious Diseases*), Alan R. Bisno, MD, Chief of Medical Service at the Miami Veterans Affairs Medical Center, and his coauthors look at issues in the clinical management of group A streptococcal pharyngitis. The authors note that because the symptoms of group A streptococcal pharyngitis resemble those of other nonstreptococcal upper respiratory infections, clinicians must exercise caution in both making a diagnosis and prescribing treatment. Moreover, group A streptococcal pharyngitis is the only common type of acute pharyngitis for which antibiotic therapy is clearly effective and indicated (with the exception of gonococcal pharyngitis). Diagnosis should be suspected on clinical and epidemiological grounds and then should be confirmed by either a throat culture or a rapid antigen detection test (RADT). Specific diagnosis is critical because treatment of pharyngitis due to bacteria other than group A streptococcus has not been proven to be effective. Moreover, fewer than half of patients experiencing pharyngitis are in fact infected by group A streptococcus.

Bisno and associates also address the following issues: 1) For acute streptococcal pharyngitis, antimicrobial therapy should be used for a period of time and at a dose that aims to eliminate the organism from the pharynx. 2) Effective agents include penicillin and its related compounds, many of the cephalosporins and macrolides, and clindamycin. 3) Penicillin, either orally or parenterally, remains the first choice, owing to such factors as proven efficacy, safety, and low cost. 4) Erythromycin serves as an alternative for patients who are allergic to penicillin.

Misdiagnosis of acute pharyngitis or use of an inappropriate therapy exposes patients to the risks of unneeded drugs and may contribute

to the spread of antibiotic-resistant bacteria that is increasingly seen in the United States and internationally.

In certain circumstances, antibacterial drugs are associated with improved clinical outcomes among upper respiratory infections that are bacterial in origin. However, among such bacterial pathogens, drug resistance is increasing. In an article approved for continuing medical education credit, my colleague, William R. Bishai, MD, PhD, of Johns Hopkins University School of Public Health in Baltimore, and I examine the problem of growing resistance to specific antibiotics used to treat upper respiratory infections.

The rising prevalence of drug-resistant *Streptococcus pneumoniae*

ACRONYM LIST

The following acronyms appear in this Special Report supplement.

AHA	American Heart Association
ARF	Acute rheumatic fever
BPG	Benzathine penicillin G
DRSP	Drug-resistant <i>Streptococcus pneumoniae</i>
FDA	Food and Drug Administration
GABHS	Group A beta-hemolytic streptococcus
HIV	Human immunodeficiency virus
IM	Intramuscular
IV	Intravenous
MIC	Minimum inhibitory concentrations
NCCLS	National Committee on Clinical Laboratory Standards
PBP	Penicillin-binding protein
PFGE	Pulsed field gel electrophoresis
PRSP	Penicillin-resistant <i>Streptococcus pneumoniae</i>
RADT	Rapid antigen detection test
URI	Upper respiratory infections

(DRSP) is an important factor in selecting antimicrobial agents for upper respiratory infections. Recent studies indicate that steps to prevent overuse of antimicrobial agents are warranted and that restraint should be used in prescribing antibiotics for uncomplicated upper respiratory infections, particularly when a bacterial agent is not clearly the cause. Dr. Bishai and I note that having information on the local prevalence rates of DRSP is essential. In addition, we examine the issue of low-level versus high-level resistance in pneumococci and the potentially important clinical implications thereof.

Because the prevalence of drug-resistant pneumococci will likely continue to increase, the coming decade will pose many challenges in outpatient management of respiratory tract infections. New categories of antimicrobial agents, the ketolides, azalides, and oxazolidinones, for example, offer the hope of a more potent thera-

py, as increasing drug resistance reduces the efficacy of current agents. Nonetheless, reducing the rate at which drug resistance emerges through the judicious use of antimicrobial therapy is a critical priority for clinicians and patients.

...REFERENCES ...

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