Practical Considerations When Treating Children with Antimicrobials in the Outpatient Setting

Lloyd N. Werk and Howard Bauchner

Division of General Paediatrics, Boston Medical Center, Boston University School of Medicine, Boston, Massachusetts, USA

Summary

Over the past decade new antimicrobial agents have been introduced used to treat common paediatric infectious diseases such as acute otitis media and sinusitis. These agents vary with respect to their mechanism of action, dosage and duration of therapy, cost, taste and type of adverse effects. More recently, there has been concern about the overuse of antibiotics and increasing bacterial resistance, particularly Streptococcus pneumoniae, to these agents.

Dosage and duration of therapy, cost, taste, and adverse effects play important roles in determining success or failure of antimicrobial medications in paediatric patients. Use of potential alternatives and adjuncts to antimicrobial treatment, such as vaccination, control of environmental risk factors, surgical techniques and alternative medical therapies may also be employed, and the practitioner must ascertain if their paediatric patients are being treated by any of these methods. Rather than listing the therapeutic challenges for all common outpatient paediatric infectious diseases, acute otitis media (accounting for over 50% of the antimicrobial prescriptions dispensed in childhood) is used to illustrate each issue.

Clinicians are faced with a growing number of possible antimicrobial choices; concomitantly, there is increasing concern that these agents are overused. When
prescribing antimicrobial agents, we need to be familiar with what we can do to optimise the care we provide. By avoiding inappropriate or trivial use of antimicrobials, we can preserve and even strengthen our armamentarium against disease. Simple strategies can improve compliance with therapeutic regimens and improve parental satisfaction.

Paediatricians and family practice physicians are faced not only with a plethora of antimicrobials available to treat common outpatient paediatric infectious diseases, but also with conflicting recommendations and practices concerning antimicrobial selection. In addition there is a growing concern in the scientific community about bacterial resistance and parental pressures to dispense antibiotics. Recent investigations have added to our understanding of these issues.

We pooled our collective clinical and research experience in private and academic settings to identify the practical considerations faced by physicians when treating paediatric patients with antimicrobials. Pertinent studies and review articles were found after a systematic search of these topics in the recent literature using MEDLINE. In this article, we discuss common topics related to the selection of antimicrobials such as their indications, treatment options and factors affecting compliance. We focus on antibacterial agents and use acute otitis media (AOM) as a clinical example for many of these issues – since this disease accounts for the majority of antimicrobial use in children.[1,2] We also address emerging trends in patient care with respect to factors related to treatment failure and relapses, the rise in bacterial resistance to antimicrobials, and the promise of alternative therapies.

1. Background

Children are most commonly exposed to antimicrobials at an early age. In the US, two-thirds of all infants are exposed to antimicrobials within the first 200 days of life. [1,3] In national surveys, antimicrobial agents account for more than one-third of all prescriptions written for children under 10 years of age.[4,5] Common diagnoses that prompt physicians to prescribe antimicrobials include AOM, bronchitis and pneumonia, pharyngitis, sinusitis and acne. It is noteworthy that the second most common diagnosis prompting antimicrobial prescription, upper respiratory tract infection, has a viral aetiology.[6]

AOM accounts for approximately one-fifth of all antimicrobials prescribed in the US. According to the US Centers for Disease Control and Prevention, 23.6 million prescriptions of antimicrobial drugs for AOM in 1992 were presented – double the number of prescriptions from the preceding decade.[6] When following a cohort of children in Pittsburgh, researchers found approximately one-half of infants under 6 months, three-quarters of children under 1 year, and more than 90% of children under 2 years had developed at least one episode of AOM. Each year, these children spent the equivalent of 1 month on antibiotics.[7]

2. Indications

Antimicrobials prescribed in the outpatient setting may be divided into the following groups; cephalosporins (first, second and third generations), macrolides, penicillins, sulphonamides, tetracyclines, various combinations and other miscellaneous agents (see table I). In general, antimicrobial therapy is initiated on a clinical judgement of a bacteriological diagnosis, the most likely infecting micro-organism, and the known susceptibilities of the organism. Therapy suppresses the growth of micro-organisms, helps to reduce clinical signs and symptoms of disease and helps to prevent complications associated with ongoing infection.[8]

The treatment of AOM provides a good example of several principles associated with prescribing antimicrobials. After determining if a child has signs and symptoms consistent with an AOM, the clinician considers whether or not to prescribe an