

Treatment issues in...



ENT Infections

The problem of antibiotic resistance

Acute bacterial sinusitis

Otitis media

Tonsillopharyngitis

The problem of antibiotic resistance

The term ‘antibiotic resistance’ implies that a particular antibiotic is ineffective in a clinical infection, and represents a challenge to both the clinician and the pathology laboratory (Figure 1). Resistance may occur because the organism is inherently resistant to the antibiotic (for example, by production of beta-lactamase (Figure 2)). The selection of the most effective antimicrobial to treat ‘ear, nose and throat’ infections has become more difficult in recent years because of the increasing antibiotic resistance among all the commonest pathogens.^{1,2} The widespread use of antibiotics in animal husbandry and in agriculture has compounded the problem; in the USA, for example, about half of the 25,000 tons of antibiotics that are sold annually are used in agriculture and aquaculture.³ Another reason for resistance is inaccessibility (for example, the antibiotic may be unable to penetrate middle ear fluid in otitis media).



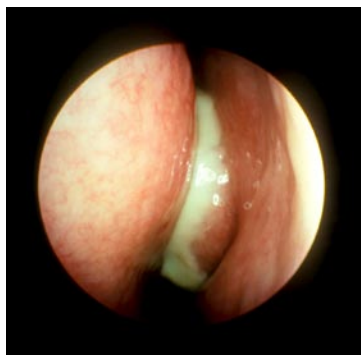
Figure 1 Antibiotic resistance is a challenge to microbiologists and clinicians

Resistance by production of beta-lactamase

- Beta-lactam antibiotics are named for the beta-lactam ring in their chemical structure and include penicillins, cephalosporins and related compounds
- Beta-lactam antibiotics are active against many gram-positive, gram-negative and anaerobic organisms
- Beta-lactam antibiotics exert their effect by interfering with molecular crosslinking within bacterial cell walls
- There are several mechanisms of antimicrobial resistance to beta-lactam antibiotics. One important mechanism is the production of beta-lactamase enzymes, which cleave the beta-lactam ring by hydrolysis, deactivating the molecule's antibacterial properties



Figure 2



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Figure 3 Endoscopic view of acute maxillary sinusitis

Clinical features of acute bacterial sinusitis

Symptoms

- Nasal congestion, purulent nasal discharge
- Maxillary tooth discomfort
- Hyposmia/anosmia
- Cough
- Facial pain/pressure, worse when bending forward
- Headache, fever, malaise

Physical findings

- Oedema of nasal turbinates
- Nasal crusts, purulence of nasal cavity and posterior pharynx

Figure 4

and *M. catarrhalis*; anaerobic bacteria and *Staphylococcus aureus* predominate in chronic sinusitis. In immunocompromised patients and in those who have nasal tubes or catheters, or who are intubated, *Pseudomonas aeruginosa* is a possible pathogen.

Treating sinusitis

Symptomatic therapy may help and antibiotic treatment is indicated to decrease severity and duration of symptoms, and to prevent complications.^{10,11} The optimal duration of therapy remains unclear; some recommend treatment until the patient becomes free of symptoms and then for an additional 7 days, others recommend 5 days.^{12,13} The direct and indirect pathogenic mechanisms of these bacteria (see page 4) means that antimicrobial therapy should be directed against all pathogens in mixed infections.

Acknowledgement

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References

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