

# Antibiotics in general practice

A recent major survey of antibiotic prescribing in hospital (Moss *et al.*, 1981) showed that, although the drugs were usually well selected, surgical prophylactic prescribing was generally unsatisfactory and poor clinical decision-making in all kinds of infections led to a lot of over-prescribing. The authors concluded that the one factor most likely to achieve improvement was the critical faculty of the clinicians. General practitioners have the freedom to develop this faculty, and much of the responsibility is our own. Illness patterns, on which an understanding of diagnosis may depend, can be fully learned only by personal follow-up.

Many bacterial infections undoubtedly resolve without antibiotics, a fact which doubtless encourages Fry (1979) to use antibiotics selectively in otitis media, and Whitfield and Hughes (1981) to advocate no antibiotics in adult tonsillitis. Yet if an antibiotic produces clinical relief, if the responsible bacterium is potentially dangerous and if unpleasant sequelae may ensue, then the argument can be extremely difficult to resolve.

## Otitis media

The common causative bacteria are *Streptococcus pneumoniae* and *Haemophilus influenzae*, with  $\beta$ -haemolytic streptococci in a few cases (Hoekelman, 1974; Howard *et al.*, 1976; Schwartz, 1977). The 30 to 40 per cent without bacterial isolation are presumably viral. Many believe an antibiotic relieves pain more effectively than other measures (Hargrave, 1968); if untreated, the risk is chronic otitis media with its complications.

Understandably, most general practitioners will use antibiotics, and if the selective approach is used (Fry, 1979) the doctor must ensure that complications are avoided and may have to accept inadequate pain relief. Ampicillin, amoxycillin, co-trimoxazole or a cephalosporin such as cefaclor are suitable antibiotics, but *H. influenzae* is not susceptible to penicillin, and does not always respond well to erythromycin. The occasional treatment failure with ampicillin or amoxycillin may reflect *H. influenzae* resistance (Howard *et al.*, 1978; Bell and Plowman, 1980).

*Mycoplasma pneumoniae* seldom needs consideration in antibiotic choice, and the role of anaerobes (Brook, 1979) is uncertain.

## Sinusitis

*S. pneumoniae* and *H. influenzae* predominate as causes of acute sinusitis and *Branhamella catarrhalis* has a possible role (Wald *et al.*, 1981). Anaerobic bacteria are sometimes associated with chronic sinusitis (Tally and Gorbach, 1979).

The antibiotic treatment of acute sinusitis is a paradox. While ampicillin, amoxycillin, co-trimoxazole or cefaclor would be expected to be effective, doxycycline

is better clinically and probably owes this to its penetration of the secretions of sinusitis (Agbim, 1974).

## Sore throat and tonsillitis

In half those with the symptom of sore throat, the throat is not inflamed and antibiotics are not indicated unless the patient rarely exhibits the bypass phenomenon or is having recurrent tonsillitis (Everett, 1979). The non-inflamed sore throat is a common feature of influenza, the 'flu-like illness and upper respiratory illness. Conversely, those patients with a visibly inflamed throat (tonsillitis and/or pharyngitis) have a 30 to 40 per cent incidence of  $\beta$ -haemolytic streptococci, and since streptococcal and non-streptococcal tonsillitis cannot be distinguished clinically, all should be treated (Everett, 1975).

The response to treatment is in dispute, but suppurative complications are prevented, and the justification for an antibiotic is the pathogenicity of the  $\beta$ -haemolytic streptococcus, which is still a potentially dangerous adversary (*British Medical Journal*, 1972, 1978; Cargill *et al.*, 1978; Cruikshank *et al.*, 1981). Penicillin is suitable (Oakes *et al.*, 1973) and Grob (1977) recommends erythromycin to avoid penicillin allergy. Co-trimoxazole is sometimes less effective and both ampicillin and amoxycillin are best avoided because of the increased risk of rash in patients with infectious mononucleosis.

Long-term prophylactic penicillin can prevent recurrent attacks of tonsillitis (Donovan, 1973), and given in a normal daily dose is best suited to the child already awaiting tonsillectomy.

The role of other agents is less clear. Flucloxacillin can cure an impending quinsy and may reflect a staphylococcal cause, and on the basis of studies of  $\beta$ -lactamases produced by resident flora in the throat, anaerobes may have a role (Reilly and Willis, 1980); simple penicillin may not always be the best choice (Brook *et al.*, 1981).

## Infectious mononucleosis

Despite the absence of antibiotic response, the antibiotic in use should be continued since a  $\beta$ -haemolytic streptococcus may co-exist. If the patient is already on ampicillin or amoxycillin, a change should be made. Anaerobic infection may play a part. The use of metronidazole (Hedström, 1980) shortens the duration of the tonsillitis and the febrile period, but the response may not be dramatic.

## Cough

How to treat the coughing child with no abnormal chest signs and no other antibiotic indication is a common dilemma. Antibiotics seldom help and should not be

prescribed, and a doctor should not be afraid of saying that there is no treatment and that the disease has to run its course. There is uncertainty, however, if the cough is bad, chesty, croupy (expiratory) or prolonged, and an antibiotic may then be prescribed in good faith on a questionable basis. Most coughs will be viral, but allergic rhinitis, low-grade bronchospasm, parental smoking (Colley *et al.*, 1974; Harlap and Davies, 1974), gas cooking (Melia *et al.*, 1977) or an inhaled foreign body (Goodall, 1973) may be responsible. Antibiotics are usually used for cough with asthma, but bronchodilators alone can be effective, particularly if delivered directly to the respiratory tract by nebulized inhalation or salbutamol rotahaler (Milner, 1978).

The same principles apply to adults, and the equivalent uncomplicated cough occurs in influenza and the 'flu-like illness (Everett, 1977a). Purulent sputum suggests the need for prescription and patient pressure is high, yet in the absence of chest infection is not an indication for antibiotic use (Stott and West, 1976). It is known that mothers of children can be trained in therapeutic expectoration; are adult patients more difficult to train, or is the doctor reluctant to try?

In whooping cough, prophylactic erythromycin or co-trimoxazole may prevent the disease in contacts, particularly infant siblings (Arneil and McAllister 1977; Trollfors and Rabo, 1981), and if immunization is omitted, then it may be useful to advise a parent of its availability.

### Chest infection

The clinical difficulty of recognizing disorders described in pathological terms can be overcome by the simple expedient of avoiding antibiotics if there are no abnormal chest signs, and prescribing if there are, but it has to be remembered that children with pneumonia may have a clear chest on auscultation. The more significant infections, whether in fact pneumonia, acute bronchitis or an exacerbation of bronchiectasis, are best treated initially as pneumonia.

*S. pneumoniae* accounts for about two thirds of chest infections, and less common causes include *Mycoplasma pneumoniae*, influenza A and psittacosis. Infants with bronchiolitis caused by the respiratory syncytial virus are usually treated in hospital. The pneumonia complicating influenza A is classically staphylococcal, but in practice may be caused by the pneumococcus (Lancet, 1980). Initial treatment is directed at the pneumococcus, and ampicillin or amoxycillin are suitable in practice. Then later, if paired sera show a rise in antibody titre to *M. pneumoniae* or psittacosis, a change can be made to tetracycline. The early identification of *M. pneumoniae* by cold agglutinins (Macfarlane and Neale, 1979) would enable tetracycline to be used at the outset.

During an outbreak of influenza A, pneumonia may be treated with flucloxacillin plus ampicillin or amoxycillin in view of the staphylococcal risk. In the event of

penicillin allergy, co-trimoxazole is suitable for pneumonia complicating existing chest disease owing to the involvement of *H. influenzae*, while erythromycin is a better choice for pneumonia in an otherwise healthy person.

Sputum culture has not been emphasized, but it is of value when infection complicates existing chest disease, or when the patient has received many antibiotics and the expected bacterial flora may be different or resistant, for example in bronchiectasis. Clavulanate-potentiated amoxycillin (Augmentin) may be helpful in such patients.

### Chronic bronchitis

The underlying disease is non-infective and is caused by air pollution or smoking. Antibiotics are used for exacerbations, which are usually due to viruses but which may have a secondary bacterial component such as *S. pneumoniae* and *H. influenzae* (McNicol, 1976; Fanthorpe, 1978). Because so many antibiotics are apparently effective, perhaps some treated exacerbations would recover spontaneously, and perhaps bronchodilators are more valuable. Long-term prophylaxis (Sugden *et al.*, 1975) can be effective, but is avoided by most doctors because they are afraid of producing resistant strains.

### Laryngotracheitis

Antibiotic use in adults is a clinical decision based upon severity. The viral cause may have a secondary bacterial component, *H. influenzae* predominating (Noone, 1979; Leese, 1980). In children with croup, while steam is the mainstay of treatment, an antibiotic effective against *H. influenzae* is used owing to the small but serious risk of acute epiglottitis (Lewis, *et al.*, 1979; Hegde, 1981).

### Diarrhoea

Shigella, salmonella and enteropathogenic *E. coli* are isolated in only 0.5 to 3 per cent of cases of acute diarrhoea in general practice (Tuckman *et al.*, 1962; Randall and Tuckman, 1970; Everett, 1973). Antibiotics are not therefore needed (Burman-Roy, 1976). Even if one of these species is isolated, antibiotics are of little value as treatment does not hasten recovery and can prolong the carrier state (Dixon, 1965; Smith and Young, 1966; Aserkoff and Bennett, 1969). This was confirmed by Melville (1980) in an outbreak of *Salmonella typhimurium*. Unnecessary antibiotic use can encourage the emergence of resistant strains, and bacteraemic complications, though rare, do require antibiotic therapy.

The recognition of *Campylobacter* species has changed the situation because erythromycin is effective therapy (Skirrow, 1977; Lambe *et al.*, 1981). Because campylobacter enteritis cannot be reliably distinguished from other causes, because many recover spontaneously, and because erythromycin has a diarrhoea potential of its own, antibiotic use should be confined to

those with laboratory confirmed infection, and only then if symptoms still persist.

### Clinical presentations

The individual disorders outlined seldom occur in isolation. Both upper respiratory illness and 'flu comprise multiple disorders or symptoms, some needing antibiotics and some not. Pyrexia *per se*, cold in the nose, headache, muscle ache, viral meningism, non-specific vomiting or abdominal pain and uncomplicated exanthem are not helped by antibiotics.

In upper respiratory illness, selective antibiotic indication is best made by assessment of each disorder or symptom on its own merits (Everett, 1981). All patients should be seen and examined; there is no place for telephone diagnosis or the pre-signed prescription. The commitment of the doctor is on an all-or-nothing basis, and his job is to assess and advise rather than to necessarily prescribe. This management method is likely to reduce the initial consultation rate (Howie, 1975; Howie and Hutchison, 1978) and unnecessary follow-up (Stott, 1979), is acceptable (Marsh, 1977; James, 1978) and should help to avoid antibiotic prescription for psychological or social reasons (Howie, 1978). The same philosophy applies to influenza and the 'flu-like illness.

PUO in children represents the early stage of an illness, which may proceed to cold in the nose, cough, tonsillitis, otitis media, sinusitis, gastro-enteritis and/or exanthem, which are diagnosed clinically, or urinary infection which needs bacteriological diagnosis (Everett, 1977b). Antibiotics should be withheld pending diagnosis in order to avoid both unnecessary use and diagnostic confusion, because emergent diarrhoea could otherwise mean either gastro-enteritis or an antibiotic side-effect, and an emergent rash either exanthem or allergy. Urinary infection could also be masked, leaving reflux unevaluated.

### Urinary infection

There is no argument about antibiotic need in proven infection, and, in children under five years, the emphasis is on recognition because failure to recognize can allow renal damage. Clinical presentation is often atypical and includes secondary enuresis, grumbling ill health and episodes of vomiting as well as PUO. Bacteriological diagnosis is necessary with early investigation to exclude reflux (Saxena *et al.*, 1975; Smellie *et al.*, 1976; Brooks and Houston, 1977; Robson *et al.*, 1979).

In adults, bacteriological diagnosis of apparent infection is advisable before treatment, or prior urine collection may be made if symptoms warrant immediate treatment. This makes possible intelligent consideration of antibiotic needs or changes, investigation (Manners *et al.*, 1973; Brooks, 1980) or a different diagnosis. Screening is necessary in pregnancy (Polk, 1979; Grunberg, 1981), and in the elderly the emphasis is again on recognition, owing to atypical presentation (Willington, 1978; Overstall, 1979).

### Antibiotic misuse

The value of antibiotics is reduced by the spread of resistant organisms (*Lancet*, 1982) and a contributory factor is prescribing for ailments which cannot benefit. In the United Kingdom, where we prescribe antibiotics relatively much more often than in most other countries, use or misuse is very much in the hands of doctors—antibiotics cannot be obtained without prescriptions. Audit of antibiotic use is comparatively easy, since most infections are short lived and an outcome can usually be defined and measured. Thus control is in our hands; the buck starts and stops with us.

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## Self-assessment

THE current debate about self-assessment, medical audit, quality assurance and performance review is confused because the terms mean different things to different people.

The Pharmaceutical Society Council has recently approved a guide entitled "Self-assessment of professional practice" (Pharmaceutical Society, 1981). This guide is a detailed description of what is considered to