Current Practice

TO-DAY'S DRUGS

PAEDIATRIC PRESCRIBING (contd.)

TREATMENT OF INFECTIONS IN CHILDHOOD

This is by no means synonymous with antibiotic therapy; many infections in this age group are viral in origin and symptomatic treatment with antipyretics and analgesics is effective. Carré,[1] discussing the use of antibiotics in paediatrics, advises "not to use these therapeutic agents as universal antipyretics. They may mask and delay diagnosis and sensitize patients to a useful antibiotic." Hodes[2] points out that in known virus infections such as measles and chicken-pox there is less temptation to use antibiotics and for the most part those children untreated did just as well as those treated. An annotation in this journal (October 19, p. 949) discussed the use of antibiotics to forestall bacterial complications in virus infections. The conclusion was reached that antibiotics should be used only on the rare occasions when such a complication actually occurred.

When antimicrobial agents are indicated the usual four-day course may not be long enough and parents may need persuasion to continue the drug for the seven to ten days that will minimize relapse. The tendency for the drug to be abandoned as soon as the temperature falls is a natural reaction[3] that needs to be foreseen when the prescription is made.

Infections of the Newborn

Controversy still exists as to when an infection in a newborn baby demands the use of a parenteral antibiotic. While the free use of antibiotics such as erythromycin has reduced the mortality in certain groups of infants, it has also been associated with an explosive appearance of resistant strains of staphylococci in hospital practice. It therefore seems wise to restrict systemic antibiotic administration to those infants suffering from a more deep-seated infection such as omphalitis, paronychia, respiratory infection, or osteitis. This would not apply to the same extent to babies delivered at home. Tetracycline has hitherto played a useful part in this type of case, but its use has been criticized[4] because of staining of the infant's teeth and of growth retardation in premature babies. Before condemning this well-tried drug one would like to be reasonably sure that its successors were equally effective and, after ten years' usage, no more toxic. A possible alternative would be a combination of ampicillin together with either cloxacillin, erythromycin, or fusidic acid. The list of drugs that may be harmful in the newborn increases almost yearly, recent additions being sulphafurazole, chloramphenicol, and novobiocin. The ototoxic risks of streptomycin have recently attracted attention (July 13, p. 68).

Urinary Infections

Urinary infections in childhood have a tendency to recur, and there is still considerable doubt as to how this can be prevented.[5] It seems that the best chance is obtained by early diagnosis, and this involves a readiness to perform microscopic examination of the urine in children who have unexplained pyrexia or who fail to thrive.[6] If pus is found, then full cultural and sensitivity testing should be carried out before antibiotic therapy is started. A full two weeks' course of an effective antibiotic,[7] with an adequate follow-up for at least a year, should minimize chances of relapse. If relapse occurs this is a clear indication for further investigation to exclude a renal-tract abnormality.

Gastro-intestinal Infections

Infantile Gastro-enteritis

Although there is an established association of enteropathic *Escherichia coli* with infective enteritis in babies, there is a variable proportion of cases in which a known pathogen cannot be identified. These infections are assumed to be of viral origin.

Whatever the cause in any individual case there is no magic drug which will produce a cure; resting the bowel by the administration of "clear fluids" for at least 24 hours is still the standby of treatment. Many mothers find it impossible to carry out these simple instructions, and they offer milk or solid food before the diarrhoea has ceased. One teaspoonful of sugar to every four ounces (114 ml.) should be added to boiled water together with a small amount of salt (a quarter teaspoonful to one pint (0.6 litre)) to provide electrolyte requirements. Alternatively tablets of sodium potassium chloride compound may be used.

If the diarrhoea fails to clear on starvation, a stool should be examined bacteriologically and an antimicrobial agent given. The antidiarrhoeal effect of antibiotics has recently been investigated by Meneghello *et al.*[8] and by Kahn *et al.*[9]; chloramphenicol was found to be one of the most useful drugs in areas of the world where infantile gastro-enteritis carries a high mortality and morbidity, but in Great Britain its dangers would preclude its use for routine treatment. Sulphadimidine, neomycin, or paromomycin would therefore be preferred. Treatment should last five to seven days, and feeding should be graded so that full-strength feeds are not given until three or four days have elapsed.

For diarrhoea in older children with shigella or salmonella infections of the intestine, culture and sensitivity testing of the stool pathogen is necessary. Shigellae are usually sensitive to sulphadiazine, streptomycin, tetracycline, or paromomycin. Salmonellosis presents a problem and at times chloramphenicol may be the only effective drug.

Respiratory Infections

Epidemic Bronchiolitis

This winter plague affecting urban infants is almost certainly of virus origin, with the respiratory syncytial virus as a frequent culprit. In mild cases there is no indication for antibiotic therapy; maintenance of fluid intake by frequent feeds, diluted if necessary, and mild sedation with chloral (or dichloralphenazone) will help to maintain the infant's strength. If cyanosis occurs oxygen will be needed and hospital admission sought, and at this stage the possibility of bacterial complications is more likely. Penicillin and streptomycin in combination, or tetracycline, are the usual alternatives. The commonest cause of bacterial pneumonia under 1 year of age is staphylococcal infection. If this is suspected by the clinical and radiological signs or by the recovery of the organism from the respiratory tract, erythromycin, methicillin, or cloxacillin should at once be given. The duration of the treatment should be at least four weeks, to minimize the chance of relapse.

Acute Laryngotracheobronchitis

This somewhat rarer condition affects children from a few months old to 10 years of age and may be of virus or bacterial origin. *Haemophilus influenzae* type B is the most likely bacterial pathogen, and the isolation of this organism is one of the rare indications for the use of chloramphenicol. It need hardly be stressed that a child with croup who develops intercostal recession, or who becomes restless and cyanosed, needs urgent hospital admission with a view to tracheostomy.

Upper Respiratory Infections in Older Children

More often than not, these infections are of virus origin and need no specific therapy; usually throat swabs are not made and treatment is given without bacterial confirmation.[10] Such illness is usually self-limiting and antibiotics should not be used; only some 12 to 15% of Fry's patients with acute throat infection needed antibiotics.[11]

For routine oral administration against suspected or proved haemolytic streptococcal and other penicillin-sensitive organisms phenoxymethyl penicillin (penicillin V) and phenethicillin are probably the best. Many cases of otitis media are of virus origin and even those with otorrhoea[12] are more often infected with a coagulase-positive staphylococcus than with a haemolytic streptococcus. In such cases the drugs of choice would be erythromycin or cloxacillin.

From time to time, especially towards the end of a winter, some children have a low-grade pyrexia and recurrent cervical adenitis. Group-A streptococci are often recovered from their throat swabs. They may have been given short courses of antimicrobial drugs in the recent past without effect and still seem to be below par. These patients often respond to two or three weeks' continuous penicillin therapy, which seems to eradicate the deep-seated infection. More rarely still, a child may not be improved by penicillin and on further investigation by throat-swab culture a concomitant infection with a penicillinase-producing staphylococcus is diagnosed. A full course of erythromycin is usually effective against both organisms.

Some children in the course of an upper respiratory infection proceed to consolidation/collapse of the lung. This may be part of the " post-nasal drip syndrome " where a barking cough, especially at night, is shown to be due to sinusitis and inhaled pus leading to segmental pulmonary collapse. If possible the sputum should be cultured and an appropriate antibiotic given, but in any event the most effective therapy is postural drainage two or three times a day carried out at home by the mother: this is likely to be more effective than any expectorant cough medicine.

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Average Oral Paediatric Doses of Antibiotics and other Microbial Agents. Dose to be Repeated Six-hourly Four Times a Day

Age:	Birth	6 Months	1 Year	2 Years	5 Years	10 Years	Remarks	Available as
Average weight ..	7 lb. (3·2 kg.)	17 lb. (8 kg.)	22 lb. (10 kg.)	28 lb. (13 kg.)	40 lb. (18 kg.)	65 lb. (30 kg.)		
Sulphadimidine .. 75 mg. lb.* day	150 mg.	250 mg.	400 mg.	500 mg.	750 mg.	1 g.	Initial dose is double the maintenance dose	500 mg. tabs. Mist. pro. inf. 137 mg. ml.
Penicillin G	62·5 mg.	62·5 mg.	125 mg.	125 mg.	125 mg.	250 mg.	In cases of severe infections these doses may be doubled	Tabs. 250 and 125 mg. Syrup 125 mg. in 5 ml.
Penicillin V								Tabs. 250 mg., 125 mg., 60 mg. Liq. 62·5 mg. in 5 ml., 125 mg. in 5 ml.
Ampicillin (" penbritin ")								Caps. 250 mg. Tabs. 125 mg.
Cloxacillin (" orbenin ")								Caps. 250 mg. Syrup 125 mg. in 5 ml.
Phenethicillin (" broxil ")								Tabs. 250 mg., 125 mg. Syrup 125 mg. in 5 ml.
Tetracycline 10 mg. lb. day	25 mg.	75 mg.	100 mg.	125 mg.	150 mg.	200 mg.		Tabs. 250 mg., 100 mg., 50 mg. Susp. 25 mg. in 1 ml.
Erythromycin 10 mg. lb. day								Tabs. 250 mg., 100 mg. Liquid 20 mg. in 1 ml.
Fusidic acid, sodium salt (" fucidin ") 10 mg. lb. day	35 mg. 8-hrly.	52·5 mg. 6-hrly.	70 mg. 8-hrly.	70 mg. 6-hrly.	140 mg. 8-hrly.	250 mg. 8-hrly.		Caps. 250 mg. Susp. containing the equivalent of 35 mg. of the sodium salt in 1 ml.
Chloramphenicol 20 mg. lb. day	31·25 mg. (1 ml.)	93·75 mg. (3 ml.)	125 mg. (4 ml.)	156·25 mg. (5 ml.)	218·75 mg. (7 ml.)	250 mg. (8 ml.)		Caps. 250 mg. Liquid 125 mg. in 4 ml.
Neomycin sulphate 25 mg. lb. day	50 mg.	100 mg.	125 mg.	150 mg.	250 mg.	375 mg.		Tabs. 500 mg. Liquid 500 mg. in 28 ml. (1 fl. oz.)
Paromomycin 25 mg. lb. day	50 mg.	100 mg.	125 mg.	150 mg.	250 mg.	375 mg.	Double dose in severe or resistant cases	Caps. 250 mg. Liquid 25 mg. in 1 ml.
Streptomycin 50 mg. lb. day	100 mg.	200 mg.	250 mg.	350 mg.	500 mg.	750 mg.		Mist. streptomycin *B.P.C. 1963*, 25 mg. ml.
Nystatin	100,000 units				500,000 u. b.d.	500,000 u. t.d.s.		Tabs. 500,000 u. Susp. 100,000 u. ml.
Nitrofurantoin 3 mg. lb. day	6·25 mg.	12·5 mg.	18·75 mg.	25 mg.	37·5 mg.	50 mg.		Tabs. 100 mg., 50 mg. Susp. 25 mg. in 3·5 ml.

Where small doses of liquids result it is suggested that where possible the prescriber orders the addition of Syrup simplex *B.P.* to a final volume of 5 ml. (1 teaspoonful).
* 1 lb. = approx 0·45 kg.