ANTIBIOTICS IN GENERAL PRACTICE*

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I shall be concerned, in this lecture, with the well-established and better-known antibiotics and with their practical application under general practice conditions. With the bewildering number of antibiotics of all kinds available to the general practitioner, I think that each of us must evolve some pattern for their use in our own practices. Therefore, I intend to describe my own experiences with antibiotics under general practice conditions in England. I would imagine that these conditions do not differ, in any very material respect, from those pertaining in the U.S.A., although some of the newer antibiotics which you may be using in the U.S.A., may not yet be in common usage in England.

In the first instance, it is necessary to try and work out some form of broad classification, so that individual antibiotics may be considered in relation to the particular indications for their use in practice. I would divide antibiotics into four main groups, the narrow spectrum antibiotics, " penicillin substitutes ", the broad spectrum antibiotics and those used for local application. The well-known antibiotics may then be grouped as follows under these headings:

Narrow spectrum	—	penicillin streptomycin
" Penicillin substitute "	—	erythromycin novobiocin oleandomycin, etc.
Broad spectrum	—	tetracyclines chloramphenicol (sulphonamides)
Local application	—	neomycin, etc.

You will notice that I have included the sulphonamides under the heading of the broad spectrum antibiotics. I consider that this is necessary because, in a number of indications, the sulphonamides may provide an alternative to antibiotics or may even be used in

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conjunction with the latter. Therefore, it is difficult to consider this subject of antibiotics in general practice unless we also include the sulphonamides.

It must be remembered that in general practice, treatment is usually "blind". That is to say, bacteriological investigations are seldom done and therefore the exact sensitivity of infecting organisms to any particular antibiotic is not known. However, diseases in general practice usually run to form, and this is no bar to successful treatment in the majority of cases. Failure to respond to treatment within a short period of time, usually 48 hours, is an indication to change the antibiotic. Although this method may not be highly scientific, it does mean that the patient is treated at the earliest possible moment with, in the majority of cases, specific therapy for the condition from which he is suffering.

Narrow Spectrum Antibiotics

I will now consider the place of these various types of antibiotics in general practice therapy. If we look first at the narrow spectrum antibiotics, then streptomycin and dihydrostreptomycin are restricted to the treatment of tuberculosis. In England, the treatment of tuberculosis is entirely managed by special chest clinics and I shall not consider it in this lecture as, of course, streptomycin is only part of the chemotherapy of this condition. Penicillin, I consider to be still the most useful antibiotic which we possess in general practice. In England, resistant organisms are practically non-existent in general practice, although, as elsewhere, the resistant staphylococcus is a considerable problem in hospital. Doubtless the hospital wards provide an environment for the self perpetuation of these resistant strains, but once outside this particular environment, the resistant strains become dissipated and no longer present any problem. Certainly, it is our experience in England that those infections that we would expect to respond to penicillin in general practice, still do so. The main disadvantage of penicillin is the increasing incidence of skin sensitivity, although so far this has not prevented treatment in the majority of cases. I would entirely dismiss any gastro-intestinal side-effects that may occur with oral preparations, since, in the short courses which are all that are required in the treatment of common infections in general practice, these rarely if ever occur. The common conditions treated with penicillin in general practice are throat infections, acute otitis media, acute bronchitis, pneumonia, and local pyogenic infections such as carbuncles, whitlows, boils. There are a number of less frequent indications such as cellulitis, scarlet fever, erysipelas, mastitis, pleurisy, sinusitis, dental sepsis. Oral penicillin is very widely used

by general practitioners in England, as was shown by a recent survey (Wheatley, 1958). Until recently, however, penicillin by injection was still reserved for the treatment of localized pyogenic infections where the infection is deep-seated, and a high penicillin blood level is required to penetrate to the centre of the lesion. However, with the introduction of well absorbed preparations of penicillin V in high strengths, I now find that I am able to treat this type of infection entirely by mouth. I have not given a penicillin injection in the past year, except in the rare case of a patient who was unable to swallow tablets. My dosage regime is somewhat unusual, in that I prescribe it twice daily in the morning and evening. There are good theoretical grounds, in view of the bactericidal action of penicillin, for justifying such a schedule, but I do not intend to go into this. It is far more important in general practice to present to the patient a simple schedule to which he is likely to adhere. Most patients will remember to take tablets night and morning, whereas, in non-serious illness, they may forget frequently repeated doses, or even take them at the wrong times. My justification for this scheme is the consistently reliable results which I have obtained during the past three years. The dosage which I use for adults, is 500 mg. of penicillin V night and morning, and for children the pleasantly flavoured benzathine penicillin mixtures in the dose of 600,000 units b.d. for a child of five, and other ages in proportion. This summer in England we have had a prolonged outbreak of infected throats, consisting of typical follicular tonsillitis and granular pharyngitis. These afforded a good opportunity to record the results of the regime which I have prescribed. Normally, in this type of case one expects relief of symptoms as evidenced by fall in temperature, relief of soreness, and general regaining of the signs of well-being within 24 hours of starting penicillin therapy. If this has not occurred within 48 hours, then it is considered that the treatment is being ineffective. Using this criteria and giving a course of oral penicillin as already outlined for four days, in a series of 50 patients there was a complete cure rate of 81 per cent.

Similar results are obtained in the other conditions for which penicillin is used, but the treatment of pneumonia requires further comment. Many doctors prefer to start treatment in this potentially serious condition with an initial injection of penicillin, following this with oral therapy. I do not consider that this is necessary unless the case is a very severe one, but I do prefer to give concomitant sulphonamides with the oral penicillin in the treatment of this condition. This provides the advantage of the well authenticated synergistic action of these two substances, and also provides a safeguard against mixed infections or the possibility of the infecting

organism being insensitive to penicillin.

" Penicillin Substitutes "

I have used this term on purpose, since this group of antibiotics offers no advantage over penicillin, and no increase in the number of infections which can be treated with it. They are only alternatives when organisms have become resistant to penicillin, which is comparatively rare in general practice. As I have already said, success of antibiotic treatment is gauged by prompt clinical improvement and if this is lacking then a change is made to an alternative antibiotic. However, the " penicillin substitutes " do not, even then, offer the best second choice to penicillin itself: for we do not know whether the failure to respond to penicillin is due to penicillin resistance, or due to an infective organism not sensitive to penicillin in the first instance. Therefore, the next line of treatment would be to use one of the broad spectrum antibiotics, which would cover both contingencies. It is only when they also fail, and we have not yet obtained the result of bacteriological examination, that recourse is made to one of these " penicillin substitutes ". I still think that erythromycin is probably the best, although, being bacteriostatic, its action is still inferior to penicillin itself. Novobiocin and oleandomycin would not appear to give such high blood levels as erythromycin, but they are useful alternatives under certain conditions. The recently introduced tri-acetyl salt of oleandomycin may give better results than the parent substance itself, but even so, is probably not superior to erythromycin. During a recent trial which I conducted, using the last named antibiotic and strictly limiting its use to the indications already defined, over a period of four months only five suitable cases were seen which required a " penicillin substitute ". Tri-acetyl oleandomycin was entirely satisfactory in these cases. I have no doubt erythromycin would have been also, but this does illustrate the very few occasions on which this type of antibiotic is required in general practice.

Broad Spectrum Antibiotics

Tetracyclines are probably, at the present time, the drug of choice when a broad spectrum antibiotic is indicated. There is probably not much to choose from the point of view of anti-bacterial action between tetracycline, oxytetracycline and chlortetracycline. Chlortetracycline probably gives rise to more gastro-intestinal side-effects than the other two, of which sometimes tetracycline is tolerated better, and sometimes oxytetracycline. My personal preference is for oxytetracycline, as I have found on the whole this is better tolerated than the parent substance, and also because I can take it myself whereas tetracycline itself always gives me a gastro-intestinal upset. The main indication for it is probably in the treatment of

those infections failing to respond to penicillin, but there are several other important indications for their use. These drugs are also the first alternative in the treatment of genito-urinary and dysenteric infections, when the sulphonamides have failed. This is yet another example of the impossibility of divorcing the sulphonamides from the antibiotics when we are considering these forms of treatment in general practice. I still feel that the sulphonamide is the first choice in the treatment of acute infections of the genito-urinary tract and in acute dysentery.

Perhaps one of the most important uses for the tetracyclines at the present time, and particularly in Britain is in the prophylactic treatment of chronic bronchitis. Patients with this distressing and incapacitating condition can be kept in many cases in good health through the winter by taking a dose of 250 mg. b.d. of a tetracycline. Although on theoretical grounds one would expect such a small dose to be ineffective and to do nothing but induce drug resistance, in fact this does not occur. I think that most general practitioners have had striking proof of this in the treatment of individual cases in their practice. I certainly have, and I can recall one case particularly vividly. The patient is a middle-aged woman who over the past ten years has consistently suffered from repeated exacerbations of bronchitis during the winter months at the rate of one a month, and in some winters has been seldom free of symptoms the whole winter through. I know this patient very well because of the repeated attendances I have made in looking after her. For the last two years she has been given prophylactic oxytetracycline and during these two years has not had a single attack. To me the proof of this is that she no longer sends for me, but merely attends my surgery once a month to get further supplies of tablets. Hers is by no means an isolated case, and this clearly illustrates how the general practitioner's knowledge of his individual patients and his clinical impressions of their diseases and treatment can give him accurate knowledge of the efficacy of any recommended remedy. To my mind this is more convincing than any amount of statistics.

Chloramphenicol (chloromycetin) is very little used in England now, and I suspect this is the case in the U.S.A. Although the occurrence of fatal blood dyscrasias is probably very rare, this is sufficient deterrent to its use when others, such as the tetracyclines, over which chloramphenicol offers no advantages, are available. Probably the only absolute indications for the use of this antibiotic are in the treatment of typhoid fever which we rarely if ever see in England, and when bacteriology has shown an infection due to organisms sensitive only to it.

Before leaving broad spectrum antibiotics, we must consider the

place of sulphonamides in treatment in general practice. I still believe that the sulphonamides provide the first choice for the therapy of acute genito-urinary infections and acute dysentery. The recent introduction of long-acting compounds, such as sulphamethoxypyridazine, sulphaphenazole and sulphadimethoxine have greatly facilitated the use of this form of therapy in general practice. To present the patient with a regime involving a single dose daily, which can conveniently be taken on rising, ensures effective therapy. In the treatment of dysentery, the milder forms of which are common in England in the summer months (i.e., Sonne), I think it is now acknowledged that absorbed sulphonamide is superior in action to the previously used non-absorbed varieties. Quite apart from a more effective action, there is a great saving in the large number of tablets necessary when the drug is not absorbed into the blood stream. In 24 cases of genito-urinary infection which I recently treated with sulphadimethoxine, there was a 75 per cent cure rate within seven days. I have obtained similar results with the other two mentioned long-acting sulphonamides and these figures compare very favourably with previous treatment with sulphadimidine. In the treatment of 18 cases of acute infectious diarrhoea during the recent summer, there was a complete cure rate of 88 per cent in a period of 3 to 5 days treatment. I have also obtained similar results in the treatment of pyogenic infections and acute throat infections and these compare favourably with those obtained with oral penicillin. However, the occurrence of minor side-effects, such as headache, nausea, and vertigo, in 16 per cent of patients taking the sulphonamide, makes me feel that penicillin is the treatment of choice in these latter infections, although treatment with a long-acting sulphonamide may be both more convenient and cheaper. Of course, in general practice in Britain, at least one of the advantages of the health service is that we do not have to consider the cost of treatment, but can instead give whatever form of treatment we consider to be best for the patient's condition.

Local Application

Neomycin, a broad spectrum antibiotic which is virtually non-irritant to the skin, is pre-eminent in this field at least in Britain. Personally, I have seldom seen a local reaction to penicillin ointment, but obviously when there is nothing to choose in therapeutic efficiency, one chooses the antibiotic which is free from this side-effect. The combination of penicillin and streptomycin give a broad spectrum coverage, but there are certain objections to using streptomycin locally as well. Useful alternatives to neomycin are chloromycetin in ointment form and framycetin. There is little advantage in combining bacitracin with neomycin for this form of

therapy. I need not list the many indications for the use of the topical application of a broad spectrum antibiotic, but would mention such important ones as impetigo, infected wounds, secondarily infected skin conditions, and in the form of drops in the treatment of chronic ear infections. The addition of a corticosteroid is often of tremendous use in the treatment of these conditions. Finally, neomycin may also be given by mouth, when it is not absorbed and is another alternative in the treatment of lower bowel infections.

Conclusions

In this very brief survey of the uses of antibiotics in general practice, I have laid emphasis on particular conditions prevailing in this sphere of medicine. The particular scheme adopted by a general practitioner in his use of antibiotics, is governed by essentially practical conditions, such as the necessity to treat cases blindly, and as soon as possible. It may be a matter of opinion as to whether a scheme, such as the one I have outlined, results over all in getting the patient better quicker and more efficiently than methods adopted in hospital, where there may be delay in treatment whilst bacteriological investigations are carried out. However, we must not forget that the type of case treated in hospital is rather different to that treated in general practice, and I think that the answer is that in both spheres of medicine the most suitable scheme is adopted for the particular conditions under which treatment must be carried out.

REFERENCE

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In a six-page review article of advances during the year, Dr French lists the management of hypertension and cardiovascular diseases as most important. He outlines some of the difficulties of the subject, mentioning the confusion caused by the advertisement policies of certain drug houses, and assesses new treatments. Other subjects on which he comments include haemotology, tuberculosis, geriatrics, and midwifery.

Dr French concludes by analysing the reasons for the continued upward trend in the standards of general practice, and he looks to the future with optimism.