was troubled only by a repeatedly recurring erysipelas, which could be easily suppressed with sulphonamides and penicillin. In May, 1956, she was looking very well indeed and felt well. The tumour in the left breast was still present, but was smaller and mobile. An ablation now took place, which healed without difficulty. All this time the patient was given durabolin, one dose of 25 mg. a week. The alkaline phosphatase level, which in September, 1955, was 20 K.A. units, had fallen, and in December, 1956, it was normal (Fig. 3). Unfortunately in January, 1957, her condition began to worsen and ascites developed. Durabolin began to lose its effect, and in late February it seemed as if the end was near. In connexion with an article by Goldsborough (1957) a course of chorionic gonadotrophin treatment was given (500 units three times a week). It has been reported that the patient is beginning to improve once more. She was still alive in April, 1957.

Case 3

This case, referred to above, shows that sometimes durabolin has no effect at all.

In April, 1953, a woman aged 42 felt a strand with three small lumps in the right axilla. When

FIG. 4.—Case 3. Alkaline phosphatase during treatment with durabolin and ethinyloestradiol.

in the course of that year the nodules grew larger she went to see her doctor, and after a biopsy specimen had been taken she had an operation. She had never felt anything in her breast. Post-operative radiotherapy was given and she remained in good condition till July, 1955, when she began to complain of pain in her back and lack of appetite. An x-ray picture showed a shadow in the right lung. The blood sugar was 50–94 mg./100 ml. In the evenings the temperature was subfebrile. After a few weeks' rest in bed her condition had slightly improved, but the subfebrile temperature remained.

Durabolin therapy was now instituted—first 25 mg. every fortnight, later every week. As a result the patient began to look better, but the pain in the back did not diminish. In January, 1956, this pain had increased. In an x-ray film the shadow in the right lung had gone, but there were now clear metastases in the ninth and tenth ribs. The temperature had gone up to 38.5° C. No metastases were observed in the vertebral column. An increase of the durabolin dosage to 50 mg. weekly produced no results.

As regards the alkaline phosphatase level, this had shown a continuous increase ever since October, 1955, till it reached nearly 60 K.A. units in March, 1956. In addition to the durabolin, 0.05 mg. of ethinyloestradiol was now given daily. It is remarkable that the alkaline phosphatase then fell to 17 K.A. units (Fig. 4). However, the pain in the back remained and the patient's condition deteriorated rapidly. Skin metastases began to develop also, and she died in May, 1956.

Comment

The three cases described here, and also the other 10 with marked metastases, show that in such cases we cannot expect a cure with durabolin, but, with the exception of a

single case, mentioned above, durabolin temporarily had an excellent effect. In one case calcification was observed in some of the metastases, as is sometimes seen after administration of testosterone propionate. Virilization symptoms were practically absent, and in no case did they bring inconvenience. Whether it is possible by means of durabolin to suppress metastases right at the beginning is, as already stated, obviously very hard to prove.

All eight patients who had no marked metastases but who gave cause for anxiety—for example, because the carcinoma was present during pregnancy or because they complained of vague and varying "rheumatic" pains—showed an excellent response and at the time of writing were free from cancer symptoms. All things considered, durabolin may justifiably be regarded as a valuable aid in the struggle against mammary carcinoma and as a preparation with clear advantages over testosterone propionate, the palliative value of which is established.

Summary

After a discussion on the effect of certain hormones used so far in the treatment of mammary carcinoma, including the new preparation durabolin (norandrostenedione phenylpropionate), some clinical results obtained with this preparation are reported.

It has been found that durabolin is usually a powerful and long-acting palliative which, owing to its very slight virilizing action, is a real asset in this treatment.

REFERENCES

- van Dommelen, C. K. (1956). *Ned. T. Geneesk.*, **100**, 2332.
- Dorfman, R. I. (1956). *Amer. J. Med.*, **21**, 679.
- Goldsborough, C. E. (1957). *Lancet*, **1**, 135.
- Meyer, A. S. (1955). *Biochim. biophys. Acta*, **17**, 441.
- Nathanson, I. T. (1949). *Proc. First Conference on Steroid Hormones and Mammary Cancer*, p. 1. American Medical Association, Chicago.
- Overbeek, G. A., and de Visser, J. (1957). *Acta Endocr. (Kbh.)*, **24**, 209.
- Pirquet, K. (1930). *Allergie des Lebensalters*. Thieme, Leipzig.
- van der Werff, J. Th. (1956). *J. belge Radiol.*, **39**, 706.

ANTIBIOTICS IN ACUTE TONSILLITIS AND ACUTE OTITIS MEDIA

BY

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Antibiotics are absolutely necessary in the treatment of serious bacterial infections. It is questionable, however, whether these expensive and potentially dangerous drugs are really necessary to treat all the much more frequent infections of the respiratory tract that abound in general practice. When and how should antibiotics be used for these common and relatively minor infections? Opinions differ greatly on the needs and indications, but apart from "opinions" there have been no planned studies into the matter.

This paper is an attempt to assess in a general practice the proportions of patients suffering from two readily definable and very common respiratory infections—namely, acute tonsillitis and acute otitis media—who required antibiotics in order to achieve satisfactory results, and at the same time the proportions who recovered equally well on non-specific treatment.

Methods

In carrying out this investigation the patients' interests were always of the first importance and no risk was taken or sacrifice made for the sake of the experiment. In any case of doubt the specific antibiotics were used, but where possible the aims were to withhold the antibiotics for 24 to 48 hours unless there were certain definite indications.

Acute otitis media was defined as an acute condition with earache and a red drum or with a sudden onset of discharge from the ear, either following earache or arising *de novo* with no previous history of chronic ear disease. Other features, such as deafness, perforation of the drum, and the previous history, were recorded, but were not essential for the diagnosis. Cases of chronic otitis media, with a previous history of ear troubles and in which the drum was known to be abnormal before the attack in question, were excluded from this study as there could never be any prospect of the drum returning to normal, which was the aim with every case treated here. During the three years 41 such cases were seen, all in adults over 20, and they were all excluded.

Acute tonsillitis, or, more accurately, an acute infection of the fauces, because in some the tonsils had already been removed, was taken to mean a condition with the sudden onset of a sore throat (some young children, however, often do not complain of a sore throat and the diagnosis depends on other clinical signs) accompanied by redness and swelling of the fauces, together with a definite exudate. Although almost invariably there was some general constitutional disturbance the special level of fever was not a diagnostic criterion. Cases where the throat condition was merely part of a more generalized infection of the upper respiratory tract, as a severe common cold or influenza, were excluded.

Records were kept of all cases coming within these definitions during the years 1955, 1956, and 1957. The name, age, and sex of the patients were noted, as were the clinical details, the results of bacteriological investigations, the treatment given and the reasons for the choice of treatment, the course of the acute stage, and the state of the patient at a follow-up three months or more from the onset.

The actual procedure was to make an immediate clinical assessment of each patient when first seen, to decide whether antibiotics were then necessary. Factors considered were the severity of the infection both locally, as the degree of inflammatory swelling and the amount of pain and discomfort, and generally, as the degree of toxicity and fever; the previous history, especially of past attacks; and any individual peculiarities such as a poor state of general health, whether the patient was a nursing mother or had other important duties, whether the standards of home care were poor, and so on. Unless there were definite indications for the immediate use of antibiotics these were withheld for the first 24 to 48 hours to observe the course of the illness.

If antibiotics were given the drug used was intramuscular penicillin—either a combination of crystalline and procaine penicillins (800,000 units as “abbocillin”) or this mixture plus benethamine penicillin (1,250,000 units as “triplopen”). No set “courses” were used, each case being treated individually with from one to four daily injections. In a few instances broad-spectrum antibiotics were necessary when there was no response to penicillin.

If antibiotics were withheld the patients were seen daily, or on alternate days, and symptomatic measures such as aspirin and gargles were prescribed.

A close watch was kept on all patients until the throat or the ears returned to normal. To make certain that no late complications were missed an attempt was made to see each patient at some time three months or more from the onset of the attack. At this follow-up questions were asked about the general health and whether any recurrences had occurred. The state of hearing was tested by a whispered voice at three feet, and the drums were inspected in all cases of acute otitis media. The fauces of all those who had had acute tonsillitis were examined. Few difficulties presented in following up these patients, because, except for removals, it is always very easy to establish and maintain contact with patients in the static conditions of general practice, where as a rule each patient is seen on an average three to four times a year.

During the three years 1955–7 there occurred in this practice 482 attacks of acute tonsillitis affecting 405 indi-

viduals and 552 attacks of acute otitis media in 422 individuals. The individual rate per 1,000 at risk for the practice each year for acute tonsillitis was 27 per 1,000 and for acute otitis media 28 per 1,000.

Acute Tonsillitis

The 405 patients consisted of 182 males and 223 females.

Table I shows the age distribution of all the attacks, and, bearing in mind the routine procedure that was followed, the proportions of attacks that required antibiotics and those in whom they were not used.

TABLE I.—*Acute Tonsillitis—Age Distribution and Proportions of Attacks that Required Antibiotics*

Age:	0–	5–	10–	20–	30–	40–	50+	Totals
Non-streptococcal:								
No antibiotics	19	46	29	31	16	8	10	159 (81%)
Antibiotics used	2	1	9	9	6	4	6	37 (19%)
	21	47	38	40	22	12	16	196
Haemolytic streptococcal:								
No antibiotics	12	67	30	30	48	12	2	201 (70%)
Antibiotics used	4	12	8	17	31	10	3	85 (30%)
	16	79	38	47	79	22	5	286
	37	126	76	87	101	34	21	482

Antibiotics were not used in 360 (75%) and used in 122 (25%).

It will be seen in Table I that the attacks are subdivided into those in which haemolytic streptococci were found and those in which they were not found. This is a little artificial, because it is not possible to make an accurate clinical diagnosis of the causal organism and one has to await the results of the bacteriological examinations. Treatment has therefore to be planned before the exact aetiology is known. It is interesting, however, to note that, even so, the rate with which antibiotics were used was appreciably higher (30%) in the streptococcal group than in the non-streptococcal group (19%). Among other causes were glandular fever in 8, Vincent's angina in 12, and monilia in 10. The rates for antibiotics were much higher in adults than in children because of the greater severity of the infection.

The reasons for using antibiotics in the 122 cases were: severity of the illness, 88; no satisfactory progress within 48 hours, 17; previous history, 11; and other reasons, 6.

The course of the attacks in those treated with antibiotics and those treated with non-specific methods could not be compared, because the former were highly selected and more severely affected. Nevertheless, the periods (to the nearest day) from onset for the fauces to return to normal were six days in the antibiotic group and five days in the others.

The response to penicillin was good and immediate in all but 30 (8 with glandular fever, 13 with no specific organisms in throat swabs, and 9 in which haemolytic streptococci were isolated). In the untreated group the natural improvement began to occur about 72 hours from the onset, and in only 17 of this group was penicillin eventually used because of unsatisfactory progress.

Complications.—There were no real complications in this series, either in the cases treated with antibiotics or in those treated with non-specific measures. This tends to confirm the fact that acute tonsillitis is now a relatively benign condition. There were two cases of *quinsy*, which were treated with antibiotics from the outset and cannot be termed complications. No case of *rheumatic fever* has been seen in this practice for the past 10 years, and there were none in this series. One little girl developed a classical *acute nephritis* two weeks after an acute streptococcal tonsillitis which had been treated with penicillin within 48 hours of onset. She eventually made a complete recovery.

Recurrences.—There were 65 patients who had more than one attack of acute tonsillitis during the period under review. Their age distribution is interesting, and is shown in Table II. The numbers of these recurrences are shown in Table III. The majority of the recurrences were in

TABLE II.—*Ages of 65 Patients with Recurrences of Acute Tonsillitis*

Age:	0-	10-	20-	30+	Total
Number	11	10	28	16	65

TABLE III.—*Recurrent Attacks of Acute Tonsillitis in 1955-8*

No. of Attacks	No. of Patients	Total No. of Attacks
1	340	340
2	54	108
3	10	30
4	1	4
	405	482

adults and not very severe. The child with four attacks had them all within nine months and has for the past two years been quite free of further troubles.

Follow-up three or more months after the acute attack was possible in 389 patients, and, apart from those who suffered recurrences and the little girl recovering from nephritis, all were well. Two of the patients with recurrent attacks, all adults, were advised to have their tonsils out, and did so.

Acute Otitis Media

During the three-year period there were 552 attacks of acute otitis media affecting 422 individuals (230 males and 192 females). In 85 there was more than one attack. These excluded 41 episodes of acute exacerbations in adult patients who were thought to be suffering from chronic otitis media.

Clinically acute otitis media in general practice is essentially a condition of young children (80% of cases were in children under 10). Without a doubt the condition has changed from the days when Abercrombie (1957), some 25 years ago, found that in 10% a mastoidectomy was necessary and in no less than half a myringotomy was performed. It is now generally agreed that it is a mild condition (M.R.C., 1957). Whether this has been the result of the introduction of antibiotics or coincidental with this is uncertain. It is also uncertain whether we should still regard the condition as one requiring a full course of antibiotics.

There are a number of different clinical varieties of acute otitis media, ranging from earache and a red drum in a child who does not appear to be very much disturbed to a discharging ear in a feverish and toxic patient. It is of importance to differentiate between these groups because their definition will help in deciding the needs for specific therapy.

Table IV shows the distribution of the attacks of acute otitis media in ages and also in two clinical groups—that with presenting features of earache and red drum (64% of all the attacks) and the type where there was in addition discharge from the ear (36% of the total). The proportion of the attacks in the two groups that required antibiotics is also shown. There were no appreciable differences in the proportions requiring antibiotics at the various ages.

TABLE IV.—*Acute Otitis Media—Age Distribution and Proportion of Attacks that Required Antibiotics*

Age:	0-	5-	10-	20-	30-	40-	50+	Totals
Painful ear with red drum:								
No antibiotics ..	92	136	42	6	15	9	1	301 (85%)
Antibiotics used	26	17	5	—	3	2	1	54 (15%)
	118	153	47	6	18	11	2	355
Discharging ear:								
No antibiotics ..	48	61	8	4	5	3	—	129 (66%)
Antibiotics used	30	29	3	4	—	1	1	68 (34%)
	78	90	11	8	5	4	1	197
	196	243	58	14	23	15	3	552

Antibiotics were used in 122 (22%) and not used in 430 (78%).

As in acute throat infections, the routine followed depended on the initial assessment, when the decision was made whether to use antibiotics at once or to wait and observe progress over the next 24 to 48 hours. In arriving at a decision account was taken of the severity of the illness, the degree of pain, and the extent of the general systemic upset; the previous history was of importance, antibiotics being more readily employed when there had been a number of previous attacks; then there were always special circumstances, such as social factors and other family and personal situations.

If antibiotics were not used the patient was examined daily or on alternate days. If no improvement was obviously occurring within 48 hours then antibiotics were given.

Reasons for Using Antibiotics.—In the 122 attacks these were: severity of illness, 17; no satisfactory progress within 48 hours, 63; previous history, 32; and other reasons, 10. Antibiotics were used in 22% of all the attacks, but the proportions were very different in the group without discharge and in that with discharge. Those with a painful ear and a red drum required antibiotics in only 15% of the attacks, whereas in those with discharge the rate was 34%. The reasons for the differences were chiefly that there was no definite improvement in the amount of discharge in many of the patients within the specified 48 hours.

Course.—Patients were kept under observation until the drum and the hearing returned to normal. This period of observation varied from case to case, but the average time was nine days in those without discharge and 16 days in those with discharge. In five patients the progress was very slow and oxytetracycline was used in an attempt to obtain a quicker resolution. Any comparison of the periods in the patients treated with and without antibiotics would be quite fallacious, as the cases were very highly selected, but for what they are worth the average time for recovery in those treated without antibiotics was nine days and in those treated with antibiotics it was 15 days.

Complications.—Here again there were no serious complications in any of the patients observed. No cases were referred to a consultant for advice, let alone for any active surgical treatment. Myringotomy was not necessary. In five patients the condition took more than four weeks to return to normal, but these anxieties were the only ones encountered.

Recurrences.—The natural history of acute otitis media is that it is a recurring condition of early childhood with a definite tendency towards spontaneous remission around the age of 7-8 (M.R.C., 1957). This was also found in the present survey, for the recurrent attacks in 85 patients whose ages are shown in Table V were almost all in children

TABLE V.—*Ages of Patients with Recurrence of Acute Otitis Media*

Age:	0-	10-	20-	30+	Total
Number ..	79	4	1	1	85

TABLE VI.—*Recurrent Attacks of Acute Otitis Media in 1955-8*

No. of Attacks	No. of Patients	Total No. of Attacks
1	337	337
2	58	116
3	14	42
4	10	40
5	1	5
6	2	12
	422	552

under 10 years of age. The numbers of recurrences are shown in Table VI. Almost all these recurrences were in children between 4 and 8 years of age, and they tended to occur fairly rapidly over a period of 18 months to 2 years. Even in the two children with six attacks, these all occurred over a couple of winters, with complete recovery of drum and hearing to normal.

Follow-up.—It would be ridiculous to consider the advisability of a lower rate of use of antibiotics if on follow-up an appreciable number of deaf or discharging ears or abnormal-looking drums were found. A careful follow-up was therefore necessary, and every attempt was made to see the patients three months or more from the original attack. All but seven of the 422 patients were seen—many more than once, some for a variety of other unrelated reasons. The mothers and the patients were questioned about any disabilities, and the ears were examined and the hearing was tested by ability to hear the whispered voice at three feet. Hearing appeared to be quite normal in all except three children, aged 5, 6, and 8, who were still suffering from recurring upper respiratory infections, and in whom there was a slight, but almost certainly temporary, impairment of hearing. No patient had a chronic discharging ear, and the drums appeared normal in all but the three referred to above, in whom there was thickening of the drum. The follow-up included all the 85 patients who suffered more than one attack of acute otitis media, and in these, too, the results were as satisfactory as in those who had had only one attack, with the exception of the three referred to.

Discussion

Although it is 15 years since penicillin first became widely available there are still no uniform views concerning the real indications and the best methods of use in the infections met with in general practice. The great importance of this field as one worthy of study is the fact that by far the largest proportions of antibiotics are prescribed by general practitioners. In 1956, out of a total of £11m. spent on antibiotics in Great Britain, those prescribed by general practitioners accounted for not less than £9m. (Ministry of Health, 1957, personal communication).

The prescribing habits of family doctors vary greatly. In my own practice antibiotics are used in only a quarter of all cases of acute tonsillitis and acute otitis media, with excellent results. Wheatley (1957), on the other hand, pleads that in acute tonsillitis "no patient should be denied the prophylactic and therapeutic benefits of antibiotics." In a survey by a faculty of the College of General Practitioners of some 261 cases of acute tonsillitis treated by a group of family doctors, antibiotics or sulphonamides were used in no less than 72% (W. H. J. Lord, 1957, personal communication). An M.R.C. report on acute otitis media in general practice showed an amazing range of different therapeutic habits amongst the 13 practices taking part. In seven antibiotics were used in over 90% of cases of acute otitis media; in three the rates were between 89% and 65%; and in three antibiotics were used in less than one-third. The results of all these groups were apparently equally satisfactory.

These rates are all higher than those found necessary in this particular study, and, taking into consideration the very satisfactory results achieved here with a low rate of usage, the question is raised, In how many cases of acute otitis media and acute tonsillitis are antibiotics being used unnecessarily?

In considering this question it is also necessary to remember that these drugs are not absolutely safe and they are expensive, that even in pre-antibiotic days the majority of these infections settled without any permanent effects, and that there has certainly been a diminution in virulence of the streptococci which account for so many of these conditions.

Summary and Conclusions

An attempt has been made to investigate the needs for antibiotics in the management of acute tonsillitis and acute otitis media on the supposition that not all of these infections require such specific measures.

During the three years 1955-7 all cases of acute tonsillitis and acute otitis media occurring in a South

London general practice were recorded, observed, and followed up. There were 482 attacks of acute tonsillitis affecting 405 individuals, and 552 attacks of acute otitis media in 422 individuals.

The procedure followed was to withhold penicillin (the antibiotic used) unless there were definite indications, and to follow the course carefully, always prepared to use the antibiotic where necessary.

With this routine antibiotics were required in 25% of all attacks of acute tonsillitis—19% in the non-streptococcal group and 30% in those in whom haemolytic streptococci were found in throat swabs. In acute otitis media antibiotics were needed in 22% of all the attacks—in 15% with a painful eardrum and in 34% where there was discharge from the ear.

The results in these cases were eminently satisfactory. No real complications occurred in either group, and on follow-up three months or more later only three children were found to be slightly deaf, with abnormal drums. There were no chronic discharging ears, and in other patients drums were not regarded as abnormal. Recurrent attacks were common. 65 patients had more than one attack of tonsillitis and 85 had more than one attack of acute otitis media.

This relatively small and highly personal study by one general practitioner on his own practice in one part of the country presents a pattern that might not apply wholly to the rest of the country. It does suggest, however, that it would be worth while looking further into our habits of using antibiotics.

Very large proportions of cases of acute tonsillitis and acute otitis media would seem to settle naturally and safely without the need for specific drugs, and many of us might be using these drugs unnecessarily. Admittedly it requires a considerable amount of clinical courage at first to alter our set habits and to withhold drugs that we have been in the custom of using routinely with excellent results, but, once the initial decision is made to wait and see for a day or two before using them, it is astounding how many cases of acute tonsillitis and acute otitis media will recover on their own.

REFERENCES

- Abercrombie, G. F. (1957). *Proc. roy. Soc. Med.*, 50, 409.
Medical Research Council (1957). *Lancet*, 2, 510.
Wheatley, D. (1957). *Ibid.*, 1, 164.

The rehabilitation of the newly blind is one of the subjects covered in the report of the executive council of the Royal National Institute for the Blind for the year ending March 31, 1958. The Institute has two residential rehabilitation centres (at Torquay and Bridgnorth) where the newly blind are taught how to become useful and independent citizens again. Training and employment is another subject discussed, and it is stated that the trained blind worker is found to-day in ever-increasing numbers holding his own in industry and commerce in competition with the sighted. There is a commercial training college in London where blind persons selected for ultimate employment as shorthand-typists, recorder-typists, and telephone-switchboard operators are trained. Those interested in light engineering are able to receive their basic training at the Government training centre at Letchworth; they then receive further training in the factory by the Institute's training officers. The Institute found employment for 293 trained blind persons during the year, bringing the total number of placements since the service was inaugurated in 1942 to 3,869. The report is obtainable from the Royal National Institute for the Blind, 224, Great Portland Street, London, W.1.