

DEMETHYLCHLORTETRACYCLINE* IN ACUTE CONJUNCTIVITIS

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Recently a new addition to the already big group of tetracyclines was discovered. The prototype of this group, chlortetracycline, (Aureomycin) was first introduced in 1948, followed by oxytetracycline (Terramycin) two years later. A third member of the group, tetracycline (achromycin, tetracycl) was then obtained, possessing neither the chlorine atom or OH group of its predecessors respectively.

In 1957 Mc Cormick et al described a new family of tetracyclines characterized by the absence of a CH₃ group which is found in all the others. One of these, demethylchlortetracycline was produced by a mutant of Duggar's original strain of *Streptomyces aureofaciens* from which chlortetracycline had first been obtained. It was found to be stable with a high degree of resistance to degradation by acid or alkali. Its antibacterial activity compared favourably with that of other tetracyclines. Systemically it was also found that it remained in effective concentration in the blood longer than any other tetracycline.

It has been found that Demethylchlortetracycline was more active than Tetracycline by a factor of 2 or of equal activity but rarely less. This applies both to Gram positive and Gram Negative organisms. It was also found that Demethylchlortetracycline exceeded Tetracycline in its activity against *Streptococcus pyogenes* by a factor averaging 2.3. Against normally sensitive staphylococci Demethylchlortetracycline equals Chlortetracycline and both are more active than Tetracycline.

Cross Resistance, however, is complete whether in organisms resistant when isolated or in those artificially habituated.

Since the discovery of Demethylchlortetracycline in 1957 various preparations for the local use of this antibiotic have become available. It was felt desirable to put one of these preparations in a form of an Ophthalmic ointment through a trial.

SUBJECT MATERIAL

With the co-operation of the outpatient department, fresh cases of acute conjunctivitis were sent direct to the Ophthalmic Department. They were all seen by one specialist and graded according to their severity. The degree of conjunctivitis was judged clinically by the amount of congestion, chemosis, discharge, presence of haemorrhage, and the presence or absence of associated corneal ulceration. Those who had been given previous medication either locally or systemically for the present inflammation were excluded from the trial. The cases were chosen irrespective of age, sex, or race and before treatment with Demethylchlortetracycline was started, the patients were sent for bacteriological investigations and cytological examination. In all 30 cases were treated.

TREATMENT

The patients were instructed either directly or through their parents to instil the ointment every two hours in the affected eyes and to report each day for the progress to be estimated. No systemic treatment of any sort was given.

TABLE I

Investigation conducted	No. of positive cultures (pathogenic organisms)	No. of negative cultures (no growth)	No. of cultures with growth of non pathogenic organism
30	15	8	7

TABLE II

PATHOGENIC ORGANISM GROWN

Staphylococci	4	} All were strongly sensitive to Ledermycin except in one case where streptococci pyogenes was grown.
Streptococci	3	
Kochweeks	7	
Ptreumococci	1	

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Although in half the cases smears and cultures were negative for pathogenic organisms, conjunctival cytology was positive indicating presence of varying degrees of infection. Bacteriological cultures of material taken from the conjunctiva have always been known to be erratic in its production of positive bacterial growth.

TABLE III — RESULT OF TREATMENT

No. of cases treated	No. of cases with complete cures	Average duration of treatment	Failures
30	29	3.7 days	1

The shortest period in arriving at a cure was 2 days and this was seen in 7 cases. Only one case took 6 days to clear. In 29 cases there were definite clinical improvements within 48 hours. As can be seen from the above Table the rate cure is 96.66%.

In the single case of failure the culture showed a positive growth of *Streptococcus viridans* which however was not sensitive to Demethylchlortetracycline but sensitive to Chlortetracycline. There was slight clinical improvement after 48 hours, but with the arrival of the bacteriological report, it was felt desirable that the antibiotic should be changed and the patient did improve rapidly with Chlortetracycline.

In 2 cases there were associated corneal ulcers and one of these cases took 3 days and the other 4 days to clear completely.

TOXIC EFFECTS

Although the patients were questioned on any possible local or general side effects none of them admitted to any and on clinical examination, no untoward signs were seen.

CONCLUSION

Demethylchlortetracycline has proved a reliable and effective agent in combating conjunctival infection. Associated bacteriological studies in this trial have shown essentially no difference in its pattern to studies conducted previously in Singapore. These organisms in almost all cases were susceptible to the action of Demethylchlortetracycline both in sensitivity laboratory tests and clinically. Complete cure occurred within 2 or 6 days, and on an average local application of Demethylchlortetracycline effected a cure in 3.7 days. This compares favourably with many of

the other methods of treating conjunctival inflammation with local agents.

It is felt, therefore, that Demethylchlortetracycline is a useful addition in the armamentarium of the ophthalmologist in the treatment of acute conjunctivitis. The local use of any potent antibiotic (which can also be used systemically for systemic infections) is not without its drawbacks, particularly with reference to sensitization and production of resistant strains. Demethylchlortetracycline should not replace the other antibiotics which can be applied freely locally, and should be used when the other usual agents have failed to effect any response or when sensitivity tests have shown that it is superior to the others.

SUMMARY

A clinical trial of Demethylchlortetracycline on 30 cases of acute conjunctivitis accompanied by bacteriological and cytological examinations are reported. The trial demonstrated the usefulness of this new antibiotic.

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