

THE STIMULATING ACTION OF ANTIBIOTICS OF THE
TETRACYCLINE GROUP ON THE ABSORPTIVE FUNCTION
OF THE RETICULO-ENDOTHELIAL SYSTEM

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From the analysis of the extensive literature on the subject of the effect of antibiotics on the state of the protective reactions of the organism it may be concluded that in most cases these reactions are either depressed to some extent, or are unchanged [1, 7, 8, 10]. Only in isolated papers are results described indicating that the protective reactions may be stimulated by antibiotics. Naturally, these are of special interest. Similar findings are also reported in respect to the absorptive function of the reticulo-endothelial system (RES) [3, 4, 11].

The effect of antibiotics on the RES has been studied in the laboratory of pharmacology of the Division of Chemotherapy, in particular by investigating the incidence of positive blood cultures of microorganisms injected intravenously [5, 6]. This technique, described in detail in an earlier paper [5], is based on V. K. Vysokovich's discovery of the decisive importance of the RES in the elimination of microorganisms from the blood [2, 9].

The present research is devoted to the study of the effect of chlortetracycline and oxytetracycline on the absorptive function of the RES.

Experimental Method and Results

Experiments were carried out on albino mice weighing 18-20 g, divided into groups each containing 20-25 animals. The antibiotics were administered in different doses once by mouth 30 minutes before injection, or intravenously 5 minutes before injection of a culture of staphylococcus, strain No. 209.

The ability of chlortetracycline and oxytetracycline to stimulate the absorptive function of the RES when administered in therapeutic doses or even in slightly larger doses was demonstrated. The experimental results are shown in Tables 1 and 2.

TABLE 1. The Effect of Chlortetracycline on the Absorptive Function of the RES in Mice

Mode of administration	Dose (in mg 18-20 g)	No. of colonies of staphylococcus grown from 0.01 ml blood
Per os	1	74 ± 10.1 (54-94)
	2	48 ± 5.7 (37-59)
Control	—	105 ± 6.3 (92-118)
Intravenously	0.01	77 ± 11.6 (54-100)
	0.1	47 ± 4.5 (38-56)
	0.5	34 ± 8.7 (23-45)
	1	73 ± 9.8 (53-92)
Control	—	72 ± 9.0 (54-89)

TABLE 2. The Effect of Oxytetracycline on the Absorptive Function of the RES in Mice

Mode of administration	Dose (in mg/18-20 g)	No. of colonies of staphylococcus grown from 0.01 ml blood
Per os	1	205 ± 7.1 (180-219)
	2	185 ± 11.0 (162-207)
Control	—	298 ± 43.7 (207-389)
Intravenously	0.1	172 ± 9.8 (151-192)
	0.5	173 ± 11.4 (149-197)
Control	1	238 ± 14.4 (209-261)
	—	243 ± 19.7 (202-238)

The results given in Tables 1 and 2 show that chlortetracycline and oxytetracycline in doses of 1 and 2 mg given by mouth, and in doses of 0.1 and 0.5 mg when injected intravenously, had a stimulating effect on the absorptive function of the RES. This was revealed by the lower incidence of positive cultures of the staphylococcus from the blood of the mice receiving tetracyclines in these doses than from the control animals. The intravenous injection of chlortetracycline revealed a dose having no stimulating action on the RES, namely 0.01 mg; the same index of successful blood culture was also obtained after injection of 1 mg, but in this case the action was undoubtedly more complex. There may be a state of equilibrium between stimulation and depression of the absorptive function of the RES here.

It may also be considered from the incidence of positive blood cultures of the staphylococcus in mice after intravenous injection of tetracyclines in a dose of 1 mg that the lower incidence of positive cultures after other doses were given (always smaller in our experiments) is not related to the direct antibacterial action of these antibiotics.

It is possible that the stimulation of the absorptive function of the RES by chlortetracycline and oxytetracycline is of importance in determining their therapeutic efficacy.

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All abbreviations of periodicals in the above bibliography are letter-by-letter transliterations of the abbreviations as given in the original Russian journal. *Some or all of this periodical literature may well be available in English translation.* A complete list of the cover-to-cover English translations appears at the back of this issue.
