

THE FATE OF SYNTOMYCINE AND ITS OPTICAL COMPONENTS IN ANIMAL ORGANISMS

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Previous research [1] has shown that after a single injection of a rabbit with syntomycine the preparation is accumulated in almost all of the organs in greater concentrations than in the blood. With a comparatively low syntomycine content in the blood, amounts of it capable of securing a medicinal effect may be accumulated in the tissues.

The aim of the present work was to examine the distribution of the optical components of syntomycine (L-mycetine and D-mycetine) and their capacity for being accumulated in the organs and tissues.

The distribution of D-mycetine and L-mycetine in an organism was studied in rabbits by a method which has been previously described [1]. The results of the experiments are set forth in Table 1.

TABLE 1

Content of Syntomycine, L-Mycetine and D-Mycetine in the Fluids and Tissues of the Rabbit 4 hours After Single Injection of the Preparation in the Form of an Aqueous Suspension

Weight of the rabbit in g	Preparation	Dose per animal in g	Content of the preparation in μg per g or per ml							
			Blood	Card. muscle	Skeletal muscle	Brain	Spleen	Liver	Kidneys	Lung
2400	Syntomycine	0.4	7.2	13	17	9	30	39	108	562
2415		0.4	18	24	12	15	28	49	138	104
2410		0.48	21	37	20	19	46	89	204	504
2600		0.52	18	35	16	< 10	22	98	213	92
2150	L-Mycetine	0.35	18	19	17	7	40	60	205	47
2185		0.36	18	19	12	32	38	41	276	39
2450		0.49	37	31	23	14	40	74	273	70
2500		0.5	15	18	< 10	< 10	42	54	198	28
2450	D-Mycetine	0.49	25	29	15	22	51	88	222	130
2450		0.49	19	24	23	20	52	58	99	52
2530		0.5	40	47	27	30	28	98	312	124

As is shown in Table 1, L-Mycetine and D-mycetine, like syntomycine, are accumulated in certain tissues and organs in greater concentrations than in the blood. The spleen, brain, liver, kidneys, cardiac muscle and skeletal muscles contain approximately the same amount of the preparations regardless of whether the animal received syntomycine, D-mycetine or L-mycetine. In our experiments the tendency to be accumulated in the lungs was somewhat more strongly marked with syntomycine.

We also examined the dynamics of the elimination of syntomycine from an organism (Table 2).

Table 2 shows that after a single injection of syntomycine (0.2 mg per g of body weight) the preparation is detected in a rabbit's urine for 2-3 days; during this period from 3.5 to 7% of the dose of syntomycine injected into the rabbit is eliminated in the urine.

TABLE 2

Elimination of Syntomycine from the Rabbit after a Single Injection of the Preparation in a Dose of 0.2 mg per g of Body Weight

Rabbit's weight in g	Dose of the preparation per animal in the	Amount of the preparation eliminated, in mg										Total amount of the preparation eliminated			
		1st day		2nd day		3rd day		4th day		5th day		in the urine		in the feces	
		in the urine	in the feces	in the urine	in the feces	in the urine	in the feces	in the urine	in the feces	in the urine	in the feces	in mg	in % of the amount injected	in mg	in % of the amount injected
2790	0.55	26.2	1.73	9.3	0.43	2.9	3.12	—	1.46	—	—	38.4	7	6.74	1.22
2810	0.55	0.42	0.1	27.48	0.8	1.67	3.23	—	0.70	—	—	29.57	5.4	4.83	0.88
1990	0.40	12.45	5.9	1.43	1.76	—	2.9	—	1.4	—	1.1	13.88	3.5	12.7	3.1
2200	0.44	18.08	18.4	2.67	1.78	—	1.72	—	1.4	—	0.5	20.75	4.7	23.8	5.4

A small amount of syntomycine can be detected in the feces of a rabbit on the fourth and fifth days; from 0.88 to 5.4% of the dose of syntomycine received by a rabbit is eliminated in the feces. In all, 6-10% of the injected dose of syntomycine is eliminated in the urine and feces. Not less than 90% of the preparation is subjected to considerable transformation within the organism.

SUMMARY

Like syntomycine, its optical components (L-mycetine and D-mycetine) are accumulated in many tissues and organs in a higher concentration than in the blood.

The study of the elimination of syntomycine from organisms has shown that 6 to 10% of the preparation leaves the organism in the urine and feces. Not less than 90% of the preparation is considerably transformed within the animal organism.

LITERATURE CITED

- [1] G. N. Pershin and V. V. Nesvadba, Chemistry and Medicine,* p. 31, State Medical Press, Moscow (1954).

* In Russian.