A COMPARATIVE STUDY OF TWO SHORT ACTING BARBITURIC ACID DERIVATIVES.*

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In previous communications (1), (2), (3), (4), (5), (6), (7), the pharmacological properties of two short acting barbituric acid derivatives, "Sodium Amytal" (Sodium Iso-amyl Ethyl Barbiturate, Lilly) and "Seconal" (Sodium Propyl-methyl-carbinyl Allyl Barbiturate, Lilly), were reported. It was concluded that "Seconal" had a shorter duration of action and that its minimal anesthetic dose (M. A. D.) and minimal lethal dose (M. L. D.) were smaller than those of "Sodium Amytal."

In the present experiments, a more extensive comparison of these two barbituric acid compounds was made in all available experimental animals. Frogs, mice, rats, guinea pigs, rabbits, cats, dogs and monkeys were used. The frogs weighed from 17 to 29 Gm., or an average of 20 Gm.; mice, 10 to 18 Gm. (average 14 Gm.); rats, 68 to 132 Gm. (average 95 Gm.); guinea pigs, 251 to 361 Gm. (average 295 Gm.); and rabbits, 1345 to 2032 Gm. (average 1663 Gm.). Solutions of the sodium salts of the compounds were injected. In frogs, the drugs were administered in the ventral lymph sac. In mice, rats, guinea pigs and rabbits, the barbituric acid derivatives were given by vein, intraperitoneally, or subcutaneously. Monkeys were injected only by vein and cats only intraperitoneally. The minimal anesthetic dose (M. A. D.), duration of action of the M. A. D., and the minimal lethal dose (M. L. D.) were determined by using five animals for each dose level.

As shown in Table I, in all the animals the M. A. D. and M. L. D. of "Seconal" are distinctly smaller than those of "Sodium Amytal." With the exception of mice, "Seconal" also has a shorter duration of action than "Sodium Amytal." In mice, however, the results are reversed; that is, "Sodium Amytal" is distinctly shorter (almost half) than "Seconal." No explanation can be given for this discrepancy. As the size of the animal increases, the duration of action of "Seconal" decreases in comparison with "Sodium Amytal," until in cats, dogs and monkeys, the duration of "Seconal" is one-half or less than one-half that of "Sodium Amytal."

TABLE I.—COMPARISON OF TWO SHORT ACTING BARBITURIC ACID DERIVATIVES.

Species of Animal.	Number of Animals Used.	Method of Administration.	"Sodium Amytal" M. A. D. Mg. per Kg.	"Sodium Amytal" Average Duration of Action of M. A. D. Minutes.	"Sodium Amytal" M. L. D. Mg. per Kg.	"Seconal" M. A. D. Mg. per Kg.	"Seconal" Average Duration of Action of M. A. D. Minutes.	"Seconal" M. L. D. Mg. per Kg.
Frogs	92	Ventral lymph sac	70	600	110	50	480	90
		Intravenous	80	60	200	50	112	130
Mice	312	Intraperitoneal	120	99	260	60	172	140
		Subcutaneous	130	114	280	70	208	160
Rats	350	Intravenous	60	111	135	30	90	80
		Intraperitoneal	80*	174	180*	40	144	110*
		Subcutaneous	110	240	230*	60	200	140*
		Oral	225	676	400	65	500	125

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[1] From the Lilly Research Laboratories, Indianapolis, Indiana.

		Intravenous	55	216	90	17.5	144	35
Guinea pigs	177	Intraperitoneal	60	240	120	20	210	40
		Subcutaneous	85	282	170	30	270	60
		Intravenous	50	200	80	20	120	45
Rabbits	50	Intraperitoneal	60	270	120	30	140	50
		Subcutaneous	70	300	150	50	155	90
Cats	35	Intraperitoneal	70	800	120	35	350	75
		Intravenous	45	920	75*	25*	443	50*
Dogs	300+	Oral	70	1340	125*	40	644	90*
		Rectal	100		200*			
Monkeys	10	Intravenous	40*	80*		17.5	40	

* Published previously (1), (2), (3), (4), (5), (6), (7).

CONCLUSIONS.

1. A more extensive comparative study of two short acting barbituric acid derivatives has been made.

2. In all animals, "Seconal" has a distinctly smaller M. A. D. and M. L. D. than "Sodium Amytal."

3. Except in mice "Seconal" has definitely a shorter duration of action than "Sodium Amytal."

4. As the size of the animal increases, the duration of action of "Seconal" diminishes more significantly than that of "Sodium Amytal."

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SOLARGENTUM SOLUTIONS—STABILITY ON AGING.*

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It has been common practice to require that solutions of the U. S. P., Mild Silver Proteins, such as Solargentum, be made up fresh just prior to use and to recommend that the solution be used only while reasonably fresh. Due to the fact that none of our observations on Solargentum had ever disclosed anything which would contra-indicate the use of solutions other than fresh ones, storage tests were made in an effort to find differences between fresh and aged solutions. Differences were not found in experiments extending over a year and at least in the case of Solargentum it is not necessary that the solutions be used only when fresh.

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