

Effect of Various Substances on Swing Sickness.

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The substances selected for study were chosen for the following reasons: The sodium barbital, sodium ethyl-allyl-thiobarbiturate (V-5),² Army Motion Sickness Preventive and thiamine had been suggested as possible remedies for motion sickness; the combinations of scopolamine and ethyl-B-methyl-allyl-thiobarbituric acid (V-12)² and of scopolamine, chlorobutanol and benzedrine had been suggested as mixtures of greater effectiveness than scopolamine alone; the mixture of scopolamine and neostigmine might retain the effectiveness in swing sickness of scopolamine¹ without the undesirable side effects;¹ the pyridoxine because it has been reported to be of value in the vomiting of pregnancy³ and of irradiation sickness;⁴ the benzedrine because it has sometimes been employed with the barbiturates to overcome the central depressant effects; and the sulfadiazine because it had been suggested as a mass prophylactic for the prevention of respiratory infections and information was desired as to whether or not it increased susceptibility to motion sickness.

The Army Motion Sickness Preventive consists of 65 mg sodium amytal, 0.40 mg atropine sulfate and 0.16 mg scopolamine hydrobromide per capsule. In this study the equivalent of 2 capsules of the Army Motion Sickness Preventive was used as a single dose.

Sulfadiazine was given to a group of subjects every day for 7 weeks. The subjects were tested at the end of the 4th and at the

end of the 7th week. A similar group received placebos for a similar period of time. All remedies except the sulfadiazine were given in No. 1 pink gelatin capsules, approximately one to 2 hours before swinging began. The method of testing susceptibility of subjects to swing sickness is the same as in the previous report.¹

The results are shown in Table I. The sodium barbital, benzedrine, V-5, thiamine and pyridoxine were of negligible effectiveness. The results with pyridoxine are not inconsistent with its possible value in the nausea of pregnancy and of irradiation sickness since the latter may be associated with liver damage. The Army Motion Sickness Preventive is moderately effective as might be predicted from its content of atropine and of scopolamine.¹ The number of subjects employed with sulfadiazine is so small that the suggested effectiveness is of no statistical significance. The data do suggest, however, that sulfadiazine in this dose does not appreciably increase the susceptibility to motion sickness. Inconsistent results were obtained with the mixture of scopolamine and neostigmine. In the group of selected subjects the mixture was considerably more effective than in the group of unselected subjects. The explanation for this is not apparent. Perhaps of more importance, however, is the observation that the mixture seems to retain some of the motion sickness preventive value of the scopolamine alone. A study of the effects of this mixture on salivation conducted as in the previous report showed that the neostigmine had abolished almost entirely the depressant effect on salivation. The mixture of scopolamine and V-12 is no more effective than the scopolamine alone was found to be.¹ The addition of chlorobutanol and benzedrine to scopolamine gave a remedy that was highly effective but the observed superiority of this mixture over scopolamine alone was not statistically signi-

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¹ Smith, P. K., and Hemingway, A., *Proc. Soc. Exp. Biol. and Med.*, 1946, **63**, 206.

² Noble, R. L., *Proc. Assn. Comm. Army Med. Res., N.R.C. Canada*, 1943.

³ Willis, R. S., Winn, W. W., Morris, A. T., Newson, A. A., and Massey, W. E., *Am. J. Obs. Gyn.*, 1942, **44**, 265.

⁴ Maxfield, J. R., Jr., McIlwain, A. J., and Robertson, J. E., *Radiology*, 1943, **41**, 383.

TABLE I.
Swing Tests on Subjects After Various Substances.

	mg	Drug		Placebo		Estimated protection %	P $\dagger$
		No. Tested	No. Vomited	No. Tested	No. Vomited		
Barbital, sodium	325	20	12	20	9	—	1.00
Benzedrine sulfate	10	20	13	20*	14	7	0.73
V-5	250	21	13	21*	15	13	0.52
Thiamine chloride	10	20	12	20*	14	14	0.66
USAMSP		19	11	19*	16	31	0.07
Sulfadiazine, 1 g $\dagger$		19	4	18	4	0	1.00
Sulfadiazine, 1 g $\ddagger$		19	5	17	7	36	0.33
Hyoscine hydrobromide	0.75						
prostigmine bromide	15.0	20	10	21	20	48	0.01
Hyoscine hydrobromide	0.75						
prostigmine bromide	15.0	81	17	365	98	22	0.28
Pyridoxine hydrochloride	100	33	15	82	30	—	1.00
Pyridoxine hydrochloride	200	28	9	82	30	12	0.66
Hyoscine hydrobromide	0.75						
V-12	250	104	14	365	98	50	0.01
Hyoscine hydrobromide	0.75						
chlorbutanol	500						
benzedrine sulfate	10	145	14	365	98	64	0.01

* Subjects acted as own controls, receiving the drug the second or third time swung and the placebo the other time.

$\dagger$ Tested after receiving the drug for 4 weeks.

$\ddagger$ Tested after receiving the drug for 7 weeks.

$\dagger$ Probability that observed difference could have occurred by chance.

ficant.

Summary. 1. Sodium barbital, benzedrine, V-5, thiamine, and pyridoxine were of no demonstrated value in the prevention of swing sickness. 2. Sulfadiazine in daily doses of 1 g did not appreciably affect the susceptibility to swing sickness. 3. A mixture of sodium amytal, atropine, and scopolamine was effective in swing sickness but probably not significantly more effective than could be predicted from its content of atropine and scopolamine. 4. The addition of neostigmine

to scopolamine decreased the effectiveness of this mixture over that of scopolamine alone but did not entirely abolish it, although it effectively prevented the depressant action of scopolamine on salivation. 5. The addition of the thiobarbiturate V-12 to scopolamine did not increase its effectiveness in swing sickness. 6. A mixture of scopolamine, chlorbutanol and benzedrine was insignificantly more effective than the scopolamine alone in a similar dose.

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Effect of Anoxic Anoxia on Body Weight Loss in Rats.

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Fasting rats lose a significantly greater amount of weight when exposed to simulated

altitudes of 8,000, 18,000 and 28,000 ft. than at normal barometric pressure.^{1,2} Since the effect of anoxia on the weight and the water

¹ Van Liere, E. J., *Anoxia, Its Effect on the Body*, The University of Chicago Press, Chicago, 1942.

² Swann, H. G., and Collings, W. D., *J. Aviation Med.*, 1943, **14**, 114.