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Effect of Adrenal Cortical Extract on Experimental Hyperthyroidism in Dogs.

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Marine, Lowe, and Cipra[1] suggested that the increased heat production of newly-born infants during their second week of life was due to the involution of the adrenal cortex, Marine and Baumann[2] reported that the O_2 consumption of rabbits is increased, when the adrenal cortex is destroyed either in part or *in toto,* and the increase in O_2 consumption is proportional to the amount of adrenal cortical tissue destroyed. Shapiro and Marine[3] reported that the symptoms of hyperthyroidism were alleviated in a patient with Graves' disease, upon the eating of raw desiccated adrenal tissue. From all the above data Marine[4] concludes that decrease in adrenal cortical secretion may be a factor in causing hyperthyroidism.

Oehme[5, 6] reports that injection of cortin into guinea pigs, prevents the usual action of thyroxin, while Elmer, Giedosz, and Schepps[7] report that in guinea pigs cortin will not prevent the increased O_2 consumption due to the thyrotropic hormone.

The work was done on 3 adult dogs, 2 males and one female. The dogs, for a period of 2 months, before the basal metabolic rate (B.M.R.) determinations were started, were kept on a standard diet of meat, bread, and bonemeal.

Daily B.M.R. were determined for 2-week periods under the following conditions.

1. Dogs on normal diet.
2. Dogs on normal diet plus adrenal cortical extract.
3. Dogs on normal diet plus 0.4 g of desiccated thyroid per kg of body weight.
4. Dogs on normal diet plus 0.4 g of thyroid per kg of body weight plus adrenal cortical extract.
5. Dogs on normal diet plus 0.4 g of thyroid per kg of body weight.

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1 Marine, D., Lowe, B. H., and Cipra, A., *J. Metab. Research,* 1922, **2**, 329.
2 Marine, D., and Baumann, E. J., *Am. J. Physiol.,* 1921, **57**, 135.
3 Shapiro, S., and Marine, D., *Endocrinol.,* 1921, **5**, 699.
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6 Oehme, C., *Path. u. Pharmak.,* 1937, **184**, 558.
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TABLE I.

Dog	L. O_2 consumed per kg per 24 hr			% increase above normal	L. O_2 consumed per kg per 24 hr thyroid with adrenal extract	% increase above normal	L. O_2 consumed per kg per 24 hr thyroid	% increase above normal
	Normal	Adrenal extract	Thyroid					
W	9.2	9.1	11.7	27	13.8	50	13.3	45
B	11.5	11.2	13.8	20	15.6	35.7	13.6	18.3
N	11.4	11.6	*		16.9	48.1	16.5	44.7

*B.M.R. determinations were impossible during this period because the dog was too restless.

The average results of these experiments are shown in Table I.

Dogs W and N showed no appreciable difference in O_2 consumption during the period when the dogs received adrenal cortical extract with thyroid, and the following period, when the dogs received thyroid only. Dog B did show a difference, but during the period when thyroid and adrenal cortical extract were used simultaneously, the B.M.R. was higher than during the period when thyroid alone was used.

In view of our results on dogs and the reports of Oehme[5, 6] and Elmer, Giedosz, and Schepps[7] on guinea pigs, a more careful study is necessary, as to whether there is a species difference in the ability of adrenal cortical hormone to counteract the action of thyroid and thyrotropic hormone.

Summary. In dogs potent adrenal cortical extract does not prevent the rise in O_2 consumption induced by feeding thyroid.

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