

THE EFFECT OF PROLONGED ADMINISTRATION OF ACTH ON THE UNCONDITIONED REFLEX SALIVARY SECRETION IN DOGS

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The question of changes in the functional state of the central nervous system under the influence of hormones and endocrine preparations is of great theoretical and practical interest and attracts the attention of many physiologists and pathologists [5, 7].

At present, adrenocorticotrophic hormone (ACTH), which possesses a wide spectrum of action, is receiving extensive application in clinical and experimental work. Literature data show that it exerts considerable effect on the central nervous system, including the cerebral cortex and subcortical areas. Our observations [2, 3] and the data obtained by S.P. Pyshina [4] indicate that small doses of ACTH excite the cerebral cortex while large doses inhibit it. D.A. Biriukov suggested [1] that ACTH exerted an influence on the central nervous system when given in large doses. Clinical observations point to excitatory action of ACTH and glucocorticoids on the food reflex [6].

The present investigation is concerned with the study of the effect of ACTH on unconditioned salivary secretion in dogs.

EXPERIMENTAL METHOD AND RESULTS

Experiments were carried out on two dogs (Zhelcho, weight 15 kg and Sivcho, weight 17 kg) aged about 4 years.

25 g meat-biscuit (1:3) powder served as food stimulus. The dogs consumed 5 portions at 5-minute intervals. Salivary secretion was recorded every 30 seconds during 5 minutes, 30 minutes prior to the experiment an intravenous injection of 50 mg ACTH (3-3.3 mg per 1 kg body weight) was made. A total of 8 injections was given. Each dog received 400 mg ACTH. Control experiments with intravenous injection of physiologic solution were performed before and after the experiments with ACTH administration.

In the case of the dog Sivcho administration of ACTH elicited increased unconditioned salivary secretion; this increase amounted to from 4 to 18% as compared with the normal.

The animal's behavior showed a sharp change, with restlessness and marked motor excitation. The dog flung itself about in the stand which made continuation of experiments impossible. These manifestations persisted for over two months after cessation of ACTH administration, the unconditioned salivary secretion remaining 6 to 40% higher than normal.

Injection of ACTH caused a 7 to 15% increase in unconditioned salivary secretion of the dog Zhelcho during the first two days. During the next two days, however, the salivary secretion dropped by 48% compared with the normal.

Subsequently this dog again showed increased salivary secretion and after cessation of ACTH injections it remained 29-32% higher than normal for over two months. Motor excitation was sometimes observed.

The data obtained indicate that administration of 3-3.3 mg per 1 kg body weight ACTH for 8 days elicits increased unconditioned salivary secretion in dogs. This is associated with motor excitation pointing to increased excitability of subcortical elements.

Increased subcortical excitability is evidently the result of inhibition of the cerebral cortex since our previous investigations [3] showed that large doses of ACTH inhibited the cortex. Unconditioned salivary secretion does not return to normal for a prolonged period after cessation of ACTH administration. It remains raised for several months.

SUMMARY

It was established that the administration of ACTH to dogs brought about unconditioned salivary secretion and pronounced motor excitation.

After interruption of hormone administration the unconditioned salivary secretion was still increased for a period of two months.

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