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Effect of Anoxemia on Secretion of Urine in the Dog.

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Toth¹ has reported that the breathing of low oxygen tensions resulted in a marked diminution in the rate of urine secretion. In view of the fact that there is so little in the literature regarding the effect of anoxemia on urine secretion, it was thought worth while to report certain corroborative data which have been obtained in this laboratory from time to time in our work on anoxemia.

Twelve barbitalized dogs were used in our work, and a total of 50 experiments was made. Both ureters were cannulated, and the cannulae were attached to a glass Y tube, so arranged as to be independent of the skeletal movements of the animal. The drops of urine falling from the Y tube were counted by a drop recorder. In most instances simultaneous blood pressure tracings were made. Anoxemia was produced by allowing the dogs to breathe from an apparatus previously described² for mixing oxygen and nitrogen in the desired proportions.

In 45 of the 50 experiments the rate of urine secretion was markedly diminished. In 4 experiments the rate was unchanged, and in one experiment it was increased. In nearly every case the rate of secretion returned to above its normal level within 10 minutes after the anoxemia was discontinued. Table I gives a summary of all the results obtained.

TABLE I.

% Oxygen	No. Trials	No. Diminished	No. Unchanged	No. Increased
5.0	13	13	0	0
6.0	6	6	0	0
6.67	11	9	2	0
8.0	6	5	1	0
10.0	12	10	1	1
12.0	2	2	0	0
Total	50	45	4	1

The constant results obtained with the milder degrees of anoxemia indicate that the threshold for barbitalized dogs is above 12%

¹ Toth, L. A., *Proc. Am. Physiol. Soc.*, 1935, **47**, 132.

² Van Liere, E. J., *Am. J. Physiol.*, 1927, **82**, 727.

oxygen. The mechanism involved in this diminution in urine secretion is not fully understood, but in view of the work of Adolph³ it is felt that the increased secretion of epinephrine may play a part. This, however, may not explain the fact that the depression in secretion was obtained almost immediately upon administering the anoxemia. It is possible that this sudden depression is due to vasoconstriction produced by a reflex nervous mechanism. The reflexes involving the kidney of the dog may well be different from those described by Adolph³ in the frog, an amphibian. Of course, such a reflex nervous action could be followed and enhanced by the epinephrine action.

The supernormal phase which occurred in many instances may be due to a vasodilation, following the vasoconstriction in the kidneys. Such a reversal phenomenon is characteristic of epinephrine action.

It must also be pointed out that the hyperventilation produced by anoxemia causes changes in the reaction of the blood. It is possible that this is another factor which must be considered in the mechanism of the depression of urinary secretion by anoxemia.

Summary. Breathing of oxygen tensions of 5.0% to 12.0% caused a marked diminution in the urine secretion in 45 of 50 experiments upon 12 barbitalized dogs.

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A Comparison of Effects of Stimulation of Right and Left Peripheral Vagus with Action of Acetylcholine on Electrocardiogram of the Cat.

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Electrocardiograms were taken in a series of experiments on 40 cats, in which nembutal was the anesthetic employed. The procedures were as follows:

1. Stimulation of the right and left peripheral vagus only; (20 cats.)
2. Jugular injection of acetylcholine (2 to 6 mg./kg.). (20 cats.)

³ Adolph, E. F., *Am. J. Physiol.*, 1934, **108**, 177, and personal communication.