

The Acid-base Equilibrium of Epinephrectomized Cats.

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Because of striking changes in certain of the blood constituents, especially phosphorus, which follow adrenal extirpation in cats, and the fact that these animals present unusual changes in respiration a few hours preceding coma and death, it seemed probable that acid intoxication was one of the train of symptoms leading to death from epinephrectomy.

Unilaterally operated animals were used as controls. The amount of serum protein, total nitrogen, non-protein nitrogen, serum carbon dioxide, serum chloride, inorganic phosphorus and total base was determined. The pH was also determined.

The second adrenal was extirpated from 5 to 7 days after the removal of the first gland. The blood determinations were made again when the animals showed marked symptoms of adrenal insufficiency.

The blood was obtained with the usual precautions, and all the determinations were made according to standard procedure. The acid values of protein, bicarbonate, chloride, and phosphorus were calculated as described by Peters *et al.*¹ Total acid was taken to be the sum of all the determined acids. Organic acid was calculated by subtracting total acid from total base.

The results of the blood determinations showed that marked changes occurred in the blood following bilateral adrenal removal.

1. The tension of carbon-dioxide always dropped.
2. There was always a fall in pH.
3. The proteins rose in all except one case.
4. There was usually a marked rise in phosphorus.
5. The serum bicarbonate always diminished.
6. The total acid always diminished (*i. e.*, at the expense of bicarbonate).

Certain values showed variation in different individuals.

1. Changes in chloride concentration were variable.
2. Total base showed a striking drop in three animals.
3. Organic acid was not consistently affected, although it tended to be higher in the operated animals.

The fall, in pH, carbon-dioxide tension, serum bicarbonate and total acid, indicates that the bilaterally operated animals showing marked symptoms of adrenal insufficiency were suffering from an uncompensated non-volatile acidosis. This seems to be due to an increase of phosphoric and organic acids. In the early stages of adrenal insufficiency the acidosis is of the compensated type.

¹ Peters, J. B., Bulger, H. A., Eisenmann, A. J., and Lee, C., *J. Biol. Chem.*, 1926, lxxvii, 141.

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The Influence of Pituitrin Administration upon Certain Phases of Carbohydrate Metabolism.

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Cushing¹ and coworkers have demonstrated that the injection of extracts of the posterior lobe of the pituitary gland results in a lowering of the tolerance for carbohydrates. The purpose of this investigation was to seek further information concerning the mechanism involved in this well known action of pituitrin.

We have made a comparison of the response to intravenous glucose administration in 6 dogs with and without the injection of pituitrin. Glucose was injected intravenously by means of a Wood-yatt pump, for a period of 2 to 3 hours, at the rate of either 1.8 or 4 gms. per kilo body weight per hour. A continuous intravenous administration, of approximately .05 cc. of commercial pituitrin (Parke Davis and Co. or Eli Lilly and Co.) per kilo body

TABLE I.
Average Blood Sugar Values.

	4 gm. glucose per kg. hr.		1.8 gm. glucose per kg. hr.	
	Without Pituitrin	With Pituitrin	Without Pituitrin	With Pituitrin
Before injection	0.101	0.095	0.079	0.102
15 min. after injec. began	0.283	0.523		
30 min. after injec. began			0.231	0.315
1 hr. after injec. began	0.492	0.673	0.269	0.350
2 hrs. after injec. began	0.400	0.885	0.239	0.330
15 min. after injec. ended	0.218	0.472		
30 min. after injec. ended.			0.076	0.134