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Studies of the Blood of Suprarenalectomized Dogs

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about a recovery within two hours after administration. Calcium determinations show that the calcium has risen, on the average, 2.5 mgm. or to 8.5 mgm., which is above the level at which tetany appears.

The experiments indicate that ammonium chloride exerts a marked influence on tetany probably more through its acidotic effect on the organism than through an immediate effect on the calcium, although the rise in calcium is sufficient to cause the disappearance of tetany symptoms.

Six dogs were parathyroidectomized. Two dogs, allowed to develop tetany, recovered in 1.25 hours after receiving 100 cc. of five per cent solution NH_4Cl . The calcium of one dog rose from 6.6 to 10.1 mgm. This was the greatest rise obtained for the 1.25 hour period. Two dogs died in tetany, one in seven days, and one in forty-five days after operation. Four dogs recovered permanently, and after thirty to forty days of NH_4Cl therapy were placed on a meat diet and the NH_4Cl discontinued without ill effects.

Magnesium lactate also is effective in preventing and relieving parathyroid tetany. Operated dogs given a five per cent solution of magnesium lactate three times daily can be kept free from tetany for long periods — 70 to 100 days. The level of the serum Ca. is maintained above the tetany level (7 mgm. Ca.) by such treatment.

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STUDIES OF THE BLOOD OF SUPRARENALECTOMIZED DOGS

F. YONKMAN

Introduced by GILBERT L. HOUSER

Bilaterally operated dogs exhibit a marked disturbance in the acid-base equilibrium of the blood, as well as marked hypoglycemia. The adrenal glands were removed at two stages, seven days apart, the average survival period after the second operation being six days.

Following the second operation there is a gradual fall in the carbon dioxide capacity of the plasma although the pH remains normal. When the CO_2 capacity drops to 30 volumes per cent or

lower there is a significant fall in pH. Fluctuations in the blood sugar and a gradual rise in the inorganic phosphorus of the serum occur simultaneously with the acid-base disturbance.

With the onset of the characteristic symptoms due to suprarenal insufficiency the initial fall in blood sugar from normal to about 70 mgm. per 100 cc. occurs simultaneously with the initial fall in CO₂ capacity. Once the CO₂ capacity begins to fall it continues to drop, or it retains a fairly low level for a few hours but never rises, whereas the blood sugar fluctuates after the initial fall but drops markedly preceding coma.

The normal pH during the first drop in CO₂ capacity is characteristic of compensated acidosis whereas the sudden fall in pH with continued fall in CO₂ capacity is characteristic of uncompensated acidosis.

The rise in inorganic phosphorus and sulphur and probably certain organic acids indicates kidney failure accounting for the acidosis which eventually results in death.

The evidence indicates that death following suprarenalectomy in dogs is due to an uncompensated non-volatile acidosis due to retention of the acid end products of normal metabolism. The cause of the hypoglycemia is unknown.

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