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Local Cerebral Anaphylaxis in the Dog.

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The possible rôle of allergy in the mechanism underlying certain neurological conditions offers an interesting field of investigation. Following the recent demonstration by David and Beatrice Seegal of local organ hypersensitivity in the anterior chamber of the rabbit eye, one of us (L.M.D.) in collaboration with the Seegals produced the same phenomenon in the brain of rabbits. However, the sterile inflammation was observed only after making a second injection directly into the brain, and not, as in the case of the eye, by a simple intravenous injection. It occurred to us that this difference might be accounted for by the fact that in the eye there was more prolonged and more intimate contact of antigen with local tissue in a confined space than in the brain. How to effect this in the brain was our immediate problem.

The following procedure was carried out, using dogs as experimental animals:

Under local anesthesia a trephine hole was made and somewhat enlarged by rongeurs over the left motor area. The dura was then opened, and into a cavity in the brain tissue there was inserted a 0.5 cm. cube containing normal horse serum to which enough agar was added to make a jelly (0.6%). The wound was then closed. Immediately after the operation each dog was given from 1.5 to 5 cc. normal horse serum intravenously.

The brain in each case had been purposely injured on the left side so that immediately after operation and continuing for a few days to a week or 10 days the dogs showed a varying amount of right-sided hemiplegia. In every animal the weakness on the right side had disappeared before the next step in the experiment.

Two to four weeks after the brain operation each dog was given 5 cc. of normal horse serum intravenously. In every case in addition to the local reactions about to be described the animals within a few minutes after the intravenous dose showed some signs of generalized anaphylaxis such as rapid respiration, vomiting, diarrhea and later bloody stools. Out of 5 animals, 4 showed definite, transient, right-sided hemiplegia within a few minutes after the intravenous injection. In 2 animals this reaction was quite marked; in

the 2 others it was slight but definite. One dog failed to show any detectable weakness. The results are summarized in Table I.

TABLE I.

Dog No.	1	2	3	4	5
Date of operation	2-27	2-27	4-9	4-9	4-9
Date of injection	3-8	3-18	5-9	5-9	5-9
Hemiplegia after operation	Yes	Yes	Yes	Yes	Yes
Hemiplegia after injection	No	"	Slight	Slight	"
General reaction	Yes	"	Yes	Yes	"

Other antigens, typhoid bacilli, egg-albumen, etc., are being employed in further experiments involving modifications of technic.

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Effect of Adrenalin on the Glucose and Lactic Acid Exchange of the Brain.

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It has been shown that the brain removes glucose and lactic acid from the blood stream in both normal and diabetic conditions (McGinty,¹ Himwich and Nahum²). Since it is not probable that storage of carbohydrates occurs, the substances thus removed must have an oxidative fate.

Adrenalin in adequate amounts is known to inhibit carbohydrate oxidations (Colwell and Bright,³ Cori and Cori⁴). It might therefore alter the processes concerned with the removal of glucose and lactic acid. Dogs were used and blood samples were obtained from the superior longitudinal sinus and femoral artery simultaneously. The first experiment consisted of injecting adrenalin $\frac{1}{2}$ cc. every 15 minutes for 6 hours. Blood samples were drawn every hour. Table I presents the results.

When adrenalin was injected in small divided doses in accordance with its well known action, it produced an appreciable increase in the glucose and lactic acid level of the blood. The brain under these

¹ McGinty, D. A., *Am. J. Phys.*, 1929, **88**, 312.

² Himwich, H. E., and Nahum, L. H., 1929, **90**, 389.

³ Colwell, A. R., and Bright, E. M., *Am. J. Phys.*, 1930, **92**, 343.

⁴ Cori, C. F., and Cori, G. T., *J. Biol. Chem.*, 1928, **79**, 309.