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Demonstration in vitro of the specific affinity of thyroid cells for iodin.

By DAVID MARINE.

[*From the H. K. Cushing Laboratory of Experimental Medicine, Western Reserve University, Cleveland.*]

It is a well-known fact that thyroid tissue in vivo has a specific affinity for iodin. This has been demonstrated in several ways. The simplest and most obvious means is afforded by taking advantage of the spontaneous active hyperplasia of dogs. Having shown that the per cent. of iodin in the gland varies inversely with the degree of active hyperplasia, we were able to demonstrate that the ability of the gland to take up iodin varies with the degree of active hyperplasia present; or if expressed from the viewpoint of chemistry, the ability of thyroid tissue in vivo to take up iodin varies inversely with the degree of saturation of the gland with iodin. Such relatively large proportions of a given intake of iodin may be stored by the thyroid (for example, the recovery of 4.5 mgm. I from a 7.2 gram thyroid lobe in a dog weighing 8 kilos from a total of 50 mgm. KI given by mouth in 10 days) in vivo that it seems likely the surviving thyroid cells in vitro would exhibit this same affinity, and if so it could readily be demonstrated by perfusion.

We have perfused a large series of spleens, kidneys and thyroids of dogs, using defibrinated blood containing ⅓ (by volume) of Ringer's solution. Iodin as KI was added to the perfusion fluid in amounts varying from 5 mgm. to 40 mgm. All perfusions were carried out at temperatures varying between 35° and 37° C. All the thyroid lobes used were goitrous, varying histologically from marked active hyperplasias to colloid goitres, and in weight from 11 to 81 grams. The perfusions were continued from 1 to 2 hours, and the glands washed with Ringer's for 20 minutes. Iodin and histological examinations were made both on the control and the perfused glands. It was found that relatively large amounts of the KI were held in the thyroid which could not be washed out

by the Ringer's solution, while with the spleen and kidney none was held. It was also noted that the amount of KI taken up by a thyroid does not depend on the amount (concentration) of KI in the perfusate. Relatively much less was taken up when 40 mgm. were added to a 75 c.c. perfusate than when 10 mgm. were used. The most interesting observation was that the more marked the hyperplasia (*i. e.*, the less iodin in the gland originally), the more iodin was taken up and also the more rapidly it was taken up, just as in the case of in vivo experiments.

Thus grouping the glands according to their anatomical structure, it was found that from 10 mgm. KI the marked hyperplasias increased their iodin contents over 1,000 per cent.; the moderate hyperplasias increased over 200 per cent.; the colloid early hyperplasias increased over 100 per cent.; and the pure colloid glands about 20 per cent. This is shown more in detail in the following tabulation:

Anatomical Condition of Gland.	No. of Cases.	Average Iodin* per Gm. Before Perfusion.	Average Iodin per Gm. After Perfusion.	Average Increase in Iodin per Gm.	Per Cent. Increase in Iodin.
Marked hyperplasia.....	5	0.07	0.79	0.72	1,000+
Moderate hyperplasia.....	3	0.23	0.77	0.54	200+
Colloid early hyperplasia....	3	0.47	1.14	0.67	100+
Colloid glands.....	3	1.03	1.23	0.20	19+

Thyroid glands undergo autolysis in a few hours after removal from the body especially if kept around the body temperature. This is recognized on microscopic examination by a desquamation of the alveolar epithelium. It was found that all such glands not only fail to take up iodin from the perfusate, but lose iodin to the perfusate, a finding that we interpret as meaning that the dead cells have lost the power of storing iodin, or that the taking up of iodin by the thyroid is a property of surviving cells. Studies to determine whether the iodin taken up is as active pharmacologically as the naturally iodized thyroglobulin have not been completed. However, since the amount of iodin taken up by a given perfused gland may be independent of its concentration in the perfusate, and since the amount taken up and the rapidity of its storage varies directly with the degree of active hyperplasia,

* Expressed in milligrams per gram of dried gland.

and since only anatomically intact glands exhibit this characteristic, and since kidneys and spleens perfused under similar conditions do not take up iodin, we believe one may conclude that the surviving thyroid cells in vitro exhibit the same specific biological affinity for iodin as is manifested by the thyroid cells in vivo.

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The clinical actions of veratrum.

By RUSSELL J. COLLINS and PAUL J. HANZLIK.

[*From the Pharmacological Laboratory, Medical School, Western Reserve University, Cleveland.*]

The object of this study was to ascertain more definitely the effects produced by veratrum in normal and diseased human individuals, with special reference to the circulatory system. Many of the studies reported in the literature lack definite objective data, and whatever data exist need the confirmation of the improved and more modern methods of observation. Pharmacologically, the effects of veratrum are well understood, and the drug is prompt and effective. On the other hand, the reported clinical results are contradictory, and the drug is variously reported as uncertain, ineffective or too "toxic." However, there is reason to believe that the circulatory effects obtained in patients may resemble the pharmacological and that veratrum might be useful as a therapeutic measure for certain circulatory conditions.

In all eight individuals were studied. Of these six were convalescent and their circulations were clinically judged to be about normal. Two were cases of hypertonus. The patients always rested in the horizontal position in bed on the days when the pulse rate and blood pressure were taken. The pulse was taken for half a minute at the time of the first dose of veratrum and at intervals of fifteen minutes until the effects of the drug were pronounced. The blood pressure was taken by the auscultatory method before the administration of the drug and again when the pulse rate had reached a minimum. Certain of the cases walked around when the pulse rate reached its minimum with no effect upon the rate. The preparation used was the 10 per cent. tincture