

Action of Pituitary Pressor Hormones on Unanesthetized Rabbits.* (19348)

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As appears from recent reviews(1,2) it is commonly assumed that pituitary pressor hormones produce a fall in blood pressure when applied to unanesthetized animals. Therefore decerebrated or deeply anesthetized animals are used for the assay of pressor activity of extracts of the posterior pituitary lobe.

However, Landis, Montgomery and Sparkman(3) and Page and Ogden(4) obtained a pressor effect in unanesthetized rabbits. These authors used capsular methods for the estimation of blood pressures. This method(5) has been used with success in the estimation of renin(6-8). The close similarity between the curves obtained with anesthetized animals after injection of renin and of pituitary pressor hormone (vasopressin, pitressin) suggested a study of the action of this hormone in unanesthetized animals, because anesthetization alone produces an unphysiological fall in blood pressure(9,10).

Experiments and results. The pressor hormone used (Insipidin†) contained 20 international pressor units per ml. Dilutions were made in physiol. NaCl so that the amount administered to the rabbit was contained in 1-2 ml. This amount was injected intravenously in one ear and the blood pressure was measured on the other ear by means of Grant and Rothschild's capsule. Only one measurement was carried out on each rabbit each day in order to avoid possible secondary effects. The curves obtained were quite similar to those obtained by the usual measurements on the carotid artery of deeply anesthetized or decerebrated animals.

When the individual responses for the single doses are plotted in a log dose-response diagram Fig. 1 is obtained. It is seen that the mean values below a dose of 0.5 unit per kg

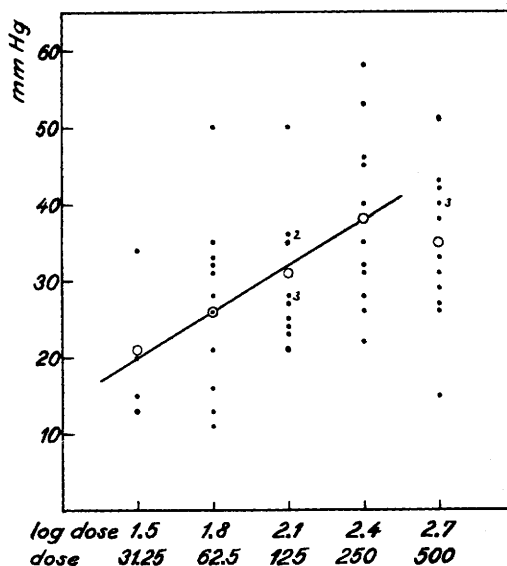


FIG. 1. Individual responses plotted with log dose (in milliunits/kg) as abscissa and blood pressure (mm Hg) as ordinate. The mean values are marked: O.

lie on a satisfactory straight line though the individual responses vary to a large extent. In the curve here presented the increase in response corresponding to a doubling of the dose is 6 mm Hg. When the measurements were repeated about 3 months later (partly with new animals) a similar curve was obtained, where a doubling of the dose represented an increase in blood pressure of 8 mm Hg. The same type of response curve was found valid for renin by Pickering and Prinzmetal(6). When the effect of the same dose was measured once each day during 6 consecutive days (6 animals) the variations in response for each animal were far smaller than the variations of the different animals to the same dose, as represented by the points in Fig. 1. A few animals behave so irregularly that they must be excluded from the measurements. The same was found true in the estimations of renin.

Discussion. Contrary to the views expressed by a number of previous investigators(1,2) the

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pituitary pressor hormone exerts a pressor action on unanesthetized rabbits. This effect is so constant that it may be used in a new and convenient method for the estimation of the potency of pressor hormone preparations. Too few animals were available to us for a thorough investigation of the accuracy of this method. In previous experiments with unanesthetized animals the fall in blood pressure is often followed by an increase(9). As the pituitary glands used by the older investigators were often air dried, enzymatic activity and bacterial growth during the drying process may have caused contamination with depressor substances. Thus a proteolysis followed by bacterial decarboxylation might yield histidine and histamine.

The results here obtained show that doses of 0.5 unit per kg (and in other series also those of 1.0 and 2.0 units per kg) fall considerably below the curve. This is indicative of a secondary depressor mechanism interfering when larger doses are given. The reaction here involved is probably the constriction of the coronary arteries observed by other investigators.

In some experiments the hormone solutions were heated, either in 0.25% acetic acid as in the standard procedure for estimating the pituitary pressor hormone or in physiological saline. No change in activity was noticed. The pressure effect was not caused by a nonspecific reaction because repeated injections of proteins (lyophilized human plas-

ma, egg albumin, edestin; 2.5 mg per kg) did not produce any significant rise (less than 10 mm, usually about 5 mm). Even after such sensitization an injection 4 weeks later did not produce any change, except a small transient decrease during the first 1-2 minutes.

Summary. The increase in blood pressure produced by injection of pituitary pressor hormone (pitressin, vasopressin) in unanesthetized rabbits may be used in the assay of this hormone.

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Uptake of Radioactive Vitamin B₁₂ by Various Microorganisms. (19349)

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Microorganisms differ in their requirements for vit. B₁₂. Some can thrive successfully without any exogenous source of this vitamin, whereas others require it for propagation; still others have a need for vit. B₁₂ only during the initial phase of growth. It is, therefore, of interest to study the possible incorporation of vit. B₁₂ from the medium into bacterial cells

of species representative of these three types. To this end, several strains of microorganisms were allowed to grow in a basal synthetic medium prepared according to Skeggs and Wright(1), to which radioactive vit. B₁₂ (2) tagged with Co⁶⁰ was introduced. The presence of the radioactive cobalt in the molecule facilitates the identification and tracing