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Effect of Synthetic Lysine-Vasopressin on Plasma Hydrocortisone Levels in Man. (22752)

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Previous studies in this laboratory(1) have demonstrated that intravenous administration of highly purified arginine-vasopressin and highly purified lysine-vasopressin, as well as Pitressin, cause increased plasma hydrocortisone concentrations in man. Because of the possibility of ACTH-releasing or adrenotrophic substances contaminating these vasopressin preparations, a comparative study has been made of the effects of synthetic lysine-vasopressin and Pitressin on plasma hydrocortisone levels.

Methods. Five normal subjects, aged 18 to 21 years, were assessed for plasma hydrocortisone responses to intravenously administered Pitressin and synthetic lysine-vasopressin† in the following manner: At 8 a. m. on 2 different test days, each subject received intravenously 2 ml of vasopressin diluent (0.5% chlorobutanol solution adjusted to pH 3.6 with acetic acid). At 8:30 a. m., the subjects received intravenously on 1 test day 2 U. Pitressin and on the other test day, 2 U. of synthetic lysine-vasopressin. The order in which each subject received the 2 vasopressin preparations was randomized. Venous blood samples of 20 ml each were obtained through an indwelling Cournand needle prior to administration of the diluent (8 a. m.), 30 minutes following injection of diluent (*i.e.*, immediately preceding injection of the vasopressin preparation), and 30 minutes following the injection of vasopressin (9 a. m.). Plasma hydrocortisone concentrations were determined in duplicate on all samples by the method of Silber and Porter(2), as modified by Peterson *et al.*(3). Pulse rates and auscultatory blood pressures were determined at 1-minute intervals before, during, and after injection of Pitressin and synthetic lysine-vasopressin.

TABLE I. Effect of Pitressin and Synthetic Lysine-Vasopressin on Plasma Hydrocortisone Concentrations.

Time of blood withdrawal	Plasma hydrocortisone, μg/100 ml plasma	
	2 U. Pitressin	2 U. synthetic lysine-vasopressin
0′ (Pretest value)	16.6	18.0
30′ Following inj. of vasopressin diluent	14.3	16.6
30′ Following inj. of vasopressin preparation	25.7	25.6

Results. Table I shows the mean plasma hydrocortisone‡ concentrations for the 5 subjects on the Pitressin test day and on the synthetic lysine-vasopressin test day. There is no significant difference between the plasma levels elicited by 2 U. of Pitressin and 2 U. of synthetic lysine-vasopressin. The mean blood pressure response to both vasopressin preparations was the same (approx. 20 mm Hg increase) while the pulse rates were un-

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‡ It has been shown in other studies(4,5) that the Silber-Porter chromogens are equivalent in concentration to free hydrocortisone.

affected by either.

Summary. 1. In man, the intravenous injection of synthetic lysine-vasopressin causes a rise in plasma hydrocortisone concentration comparable to that following the intravenous administration of Pitressin. The effect of the latter is therefore not due to impurities. 2. The pressor effect of synthetic vasopressin is of the same order as that noted following the injection of Pitressin.

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Some Effects of Parathyroid Extract and Cortisone on Metabolism of Strontium and Calcium.* (22753)

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Diuresis with an increased urinary excretion of calcium and phosphorus results when parathyroid extract is administered intraperitoneally to rats(1,2). After injection of the hormone into normal animals the blood calcium rises followed by an accompanying rise in urinary calcium. Burrows(3) reported that the rise of blood calcium following injection of parathyroid extract is a result of mobilization of calcium from bones. The subepiphyseal plate appears to be the region of the bone from which the parathyroid extract brings about removal of calcium(4). The kidneys of rats receiving parathyroid extract contained 365 times more calcium than the controls when observed within 24 hours after receiving the extract containing the hormone. However, after the first 24 hours no significant difference was observed between treatments. Cortisone has been found to increase excretion of potassium, sodium and chloride in normal dogs. Its relation to calcium deposition in soft tissues and bone growth(5,6) has been reported from several laboratories.

The investigation here reported was undertaken to determine whether strontium would respond similarly to calcium when experimental animals receive parathyroid extract and also whether cortisone would counteract deposition of these minerals in kidney tissue in rats receiving parathyroid extract.

Methods. Two experiments were conducted during these studies. Uniform Rockland rats weighing approximately 160 g were used for these experiments. The rats were housed in metabolism cages for ease of making balance studies as outlined by Hansard and Comar (7). In each experiment the rats were given 5 μc of calcium-45 or strontium-89, subcutaneously 24 hours before receiving injections of the hormones. The parathyroid extract was administered subcutaneously in doses of 100 I. U. each, 24, 32, 48 and 56 hours after receiving the nuclide. When cortisone was administered, it was given in 4 subcutaneous injections of 25 mg in a saline solution, at the same time as the parathyroid extract. Sixteen hours after receiving the final hormone

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