4965

Effect of Posterior Pituitary Lobe Extracts on the Intestine of Man and Animals.

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The stimulating action of pituitary extract on the intestine of man has been widely accepted on the basis of clinical observation. However, experimental studies employing different preparations, different physiological methods and different animals have yielded inconstant results.

Bell and Hick[1] were the first to report a stimulating effect on the intestine of rabbits. McDonald[2] and his co-workers failed to produce defecation in cats after repeated doses and recently McIntosh and Owings[3] reported relaxation of the intestine of the dog after injection of pituitary preparations.

Studies of the effect of pituitary extract on the intestine of man have been made by Pancoast and Hopkins[4] who with the X-ray method found no definite evidence of acceleration of a contrast medium through the bowel. On the other hand, Kümmel, Jr.,[5] with the abdomen of patients open noted that injections of pituitary extracts caused intestinal contractions followed by a period of active peristalsis.

The present study was begun on dogs with intestinal obstruction but later normal dogs were included. The first experiments were conducted on anesthetized dogs but subsequently a series of unanesthetized animals with Thiry-Vella fistulas was added for comparison. Tracings were made by means of balloons inserted into the intestine. In all, 23 experiments were performed on the dog. Cats and rabbits were studied briefly, 2 experiments being made on each. In order to study the effect on man 5 patients with colostomies and one with an ileostomy were selected, tracings being taken to record the intestinal movements.

In a series of 11 dogs under ether anesthesia to which pituitary extract was administered subcutaneously, or intravenously in doses of 0.5 to 2 cc. relaxation or decreased activity of the intestine was observed 6 times. (Fig. 1); no significant response occurred 4

[1] Bell, W. B., and Hick, P., *Brit. Med. J.*, 1909, February and March.

[2] McDonald, A. D., *Quart. J. Exp. Physiol.*, 1925, xv, 191.

[3] McIntosh, C. A., and Owings, J. C., *Arch. Surg.*, 1928, xvii, 996.

[4] Pancoast, H. K., and Hopkins, A. H., *N. Y. Med. J.*, 1917, cv, 289.

[5] Quoted by Schmidt, H., *Zentralbl. f. Chir.*, 1925, lii, 121.

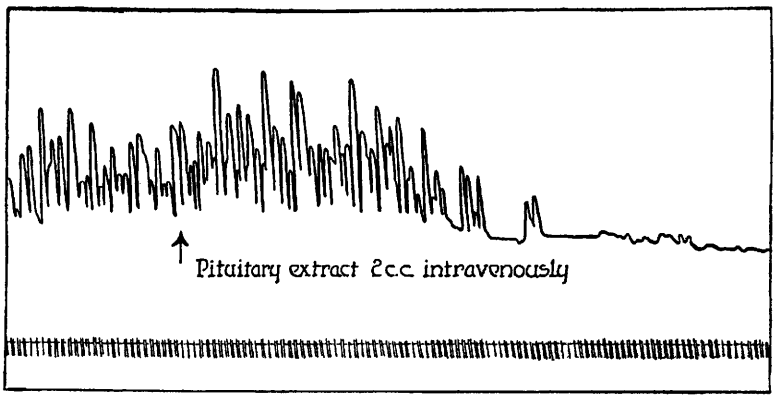

FIG. 1.—Normal bowel, anesthetized dog.

times and in only one instance was there evidence of intestinal stimulation. In 2 further experiments with the vasopressor principle (pitressin) given intravenously, no definite effect on the bowel was noted.

In a series of 5 unanesthetized dogs, no significant changes were observed in 3 cases following the injection of the extract. In one case there was a period of temporary relaxation followed by a moderate increase of tone and activity, and in another there was a slowing of the movements associated with an increase in the strength of the contractions (Fig. 2). In 5 similar experiments in which pitressin was used, the results were almost identical, there being no response 3 times and evidence of intestinal stimulation twice. The phenomenon of decreased activity and relaxation of the intestine was not observed in the unanesthetized dog.

In 2 experiments on the cat no definite intestinal response occurred but in 2 rabbits definite increase of peristalsis following intravenous administration of the pituitary extract was noted.

In 3 patients with colostomies to whom 1 to 2 cc. of pituitary ex-

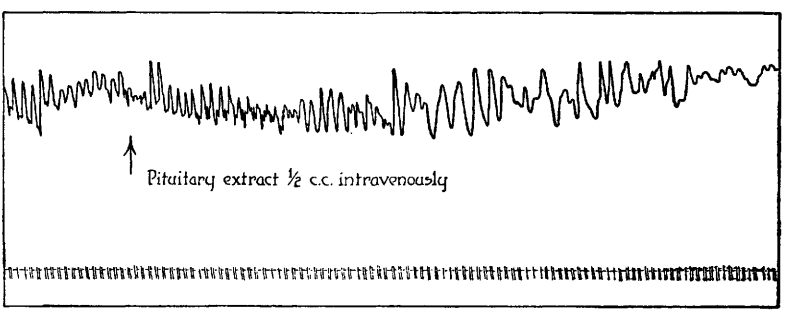

FIG. 2.—Dog with Thiry-Vella fistula.

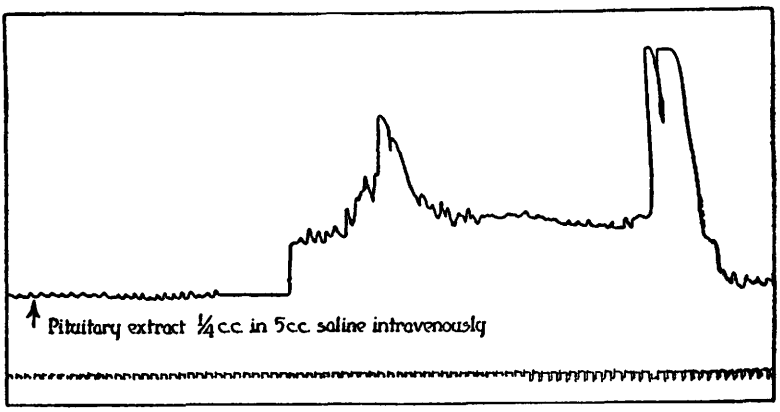

FIG. 3.—Patient: tracing thru colostomy.

tract was administered subcutaneously there occurred in each case a definite increase of intestinal activity associated with the passage of feces in from 5 to 14 minutes. In order to verify these results, 0.25 cc. was given intravenously to 2 patients with colostomies and in both of these there was definite evidence of increase of peristalsis in less than 2 minutes. (Fig. 3.)

A patient with an ileostomy was given 1 cc. of pituitary extract subcutaneously. After a period of quiescence lasting 16 minutes there was a period of increased peristalsis associated with the passage of intestinal material and gas. Subsequently he was given an intravenous injection of 0.5 cc. of the extract. In this instance the increase of peristalsis occurred in about 2 minutes.

The observations in this series of experiments corroborate the clinical impression that commercial extracts of pituitary have a definite stimulating effect upon the human colon and small intestine, especially when administered intravenously. The effect of these preparations on the intestine of the dog is inconstant, a stimulating effect being the exception rather than the rule. The intestine of the rabbit is more responsive to pituitary extract than that of either the dog or cat.