

EFFECT OF PITUITRIN ON PERISTALSIS IN THE SMALL INTESTINE

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Subcutaneous and, in particular, intravenous injection of pituitrin (0.01–0.03 ml/kg) in experiments on dogs temporarily inhibits movements of the small intestine and at the same time lowers the tone of its musculature.

Pituitrin (aqueous extract of the posterior lobe of the pituitary) contains two hormones: oxytocin and vasopressin; the latter, if given in large doses, stimulates contractions of the intestine, urinary bladder, and other organs containing smooth muscle [3]. This property of pituitrin has led surgeons to use it to stimulate intestinal movements in cases of atony [2].

However, the writer's clinical observations on the action of pituitrin in patients with intestinal atony have not confirmed this effect. In particular, in a patient with a fistula in the wall of the cecum, the use of an inflated balloon connected to a recording system did not reveal stimulation of peristalsis in the transverse colon under the influence of pituitrin. The action of pituitrin on movements of the small intestine was therefore studied in experiments on dogs.

EXPERIMENTAL METHOD AND RESULTS

An isolated segment of the ileum was prepared in dogs by the Thiry – Vella method. In addition, a V-shaped anastomosis was formed between the afferent and efferent loops, and the proximal end of the efferent loop was sutured to the abdominal wall on the right side. Intestinal peristalsis was recorded by Bogach's method [1] simultaneously in the ileum below the V-shaped anastomosis and in the Thiry – Vella loop.

Pituitrin had no activating effect on movements of the small intestine. In the dog Gnom, for instance, on the second day after operation peristalsis was absent, and it did not appear after injection of 0.5 ml pi-

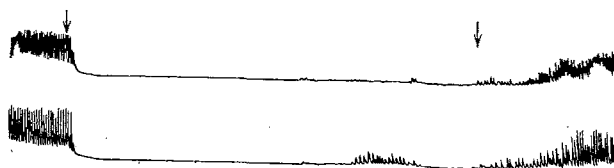


Fig. 1. Effect of intravenous injection of pituitrin on peristalsis in isolated Thiry – Vella loop on intestine and in jejunum (below). Arrow on the left indicates time of injection of pituitrin, arrow on the right is time marker after 15 min.

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pituitrin into the femoral vein. After 30 min, 1 ml of 1% omnopon solution was injected into the femoral vein, and 30 sec later active, rhythmic intestinal contractions appeared. Against the background of active peristalsis, 0.25 ml pituitrin was injected 40 min later into the femoral vein, and after 30 sec the peristalsis stopped simultaneously in the ileum below the V-shaped anastomosis and in the Thiry – Vella loop (Fig. 1). Peristalsis was resumed 15 min later.

Pituitrin was injected intravenously in 29 experiments. The hormone was injected at a time of depression of peristalsis after an operation (7 experiments), of peristalsis activated by omnopon (6), neostigmine (2), dimecoline (1), and peridural anesthesia (3), and also after blocking of the root of the mesentery and in the stage of recovery after the reappearance of peristalsis (9 experiments).

After injection of pituitrin the animals were less restless, the mucous membrane of the intestine near the fistula became pale, and intestinal juice ceased to be excreted; the portal pressure also was moderately reduced (in 7 of 8 experiments). In all cases inhibition of peristalsis was obvious, and the muscle tone of the small intestine was reduced at the same time, as shown by the decrease of pressure in its lumen.

After subcutaneous injection of pituitrin (5 experiments), peristalsis likewise did not appear, and if the hormone was injected against a background of active peristalsis, the strength of the intestinal contractions was reduced for 5–10 min.

It can therefore be concluded that the positive effect from administration of pituitrin to patients [3] is due, not to the activation of peristalsis, but to a temporary general relaxation of the musculature of the small intestine (including that of segments in spasm).

LITERATURE CITED

1. P. F. Bogach, Mechanisms of Nervous Regulation of the Motor Functions of the Small Intestine [in Russian], Kiev (1961).
2. V. G. Val'ter, Yu. F. Chichkov, and E. N. Sheptukhina, Vestn. Khir., No. 3, 112 (1963).
3. V. V. Zakusov, Pharmacology [in Russian], Moscow (1960).