synthetic gastrin and CCK-PZ was not observed, except for purified CCK-PZ (Kalolinska Institute) which exhibited little cross-reactivity at such a high level as 1 Ivy dog U/ml. Serial dilution of a pancreaticoduodenal vein plasma from a dog gave parallel curve to that of standard pancreatic glucagon.

Arginine was infused through a polyethylene catheter into the pancreatic artery of anesthetized dogs over a period of 10 min. Pancreatic-duodenal vein blood was collected through an other catheter inserted into the mesenteric vein or a small branch of the portal vein. Immediately after the start of intrapancreatic infusion of arginine (23.7 mM/Kg/min) in five dogs, immunoreactive glucagon (IRG) in pancreatic-duodenal vein plasma increased to the mean peak level 2.4 times the preinfusion level, and then subsided rapidly returning to the basal level 5 min after the cessation of the infusion. The infusion of 5% glucose into the same artery rapidly lowered the pancreatic-duodenal vein plasma IRG.

These results demonstrate that this radioimmunoassay is enough to use for the study of secretory mechanism of pancreatic glucagon under certain conditions.

Radioimmunoassay of Gastrin

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A double antibody radioimmunoassay technique for measuring serum gastrin using 1: 5,000 titer antigastrin serum of Wilson laboratories was studied.

Synthetic human gastrin I was labeled with $^{131}$I by a modification of the Method of Hunter and Greenwood (specific activity 320–350 μCi/μg). (1) Each 0.1 ml of I-SHG I (4,000 cpn), serum sample or standard gastrin, guinea pig antiserum to porcine gastrin and buffer were mixed and incubated for 24 hours at 4°C. (2) 0.2 ml of rabbit antiserum to guinea pig γ-globulin and 0.1 ml of normal guinea pig serum were added and incubated for 24 hours at 4°C. After radioactivity counting, Bound % was calculated. Standard diluent was 0.15 M NaCl-0.01 M phosphate buffer (pH 7.4) containing 0.3% BSA and 0.01 M EDTA 2Na.

A radioimmunoassay calibration diagram using SHG I from 0.1 to 1,000 pg was sigmoidal in shape, presenting straight line from 20 to 500 pg. Best results were obtained at a dilution from 1: 50 to 1: 100 of antigastrin serum and at a dilution of 1: 5 of second antibody.

Within assay variation was 8.6% (above 100 pg/ml) and 12.9% (below 100 pg/ml) of relative standard deviation. Relative potencies normalized to SHG I were as follows: SHG I 1, Caerulein 0.01, Pentagastrin 0.004, Benzylxoxycarbonyl tetragastrin 0.0002.

Fasting serum gastrin levels measured were as follows: control group 202.4 ± 101.1, gastric ulcer 137.7 ± 100.6, duodenal ulcer 163.0 ± 98.2, renal insufficiency 763.9 ± 507.3, liver cirrhosis 197.4 ± 124.2, diabetes mellitus 177.5 ± 79.8. (pg/ml: mean ± standard deviation).