1) Ninety-nine normal pancreas scintigrams could be classified into 3 types: comma-shaped (84 cases), transverse (5 cases), and sigmoid type (10 cases). Measurements of individual portions of the pancreas yielded the following values: width of the head 33±4 mm, width of the body 24±4.4 mm, width of the tail 29±4.2 mm, and the length of the normal pancreas was 136±15.9 mm. Smaller values presumably were associated with certain pathologic condition of the pancreas.

2) Abnormal scintigrams in cluded non-visualization (16 cases), defect in the head (5 cases), defect in the body (4 cases), defect in both the body and tail (7 cases), and defect in the tail (5 cases). Solitary or localized warm area and diffuse warm area were observed in 21 cases, and no diagnosis was possible in 21 cases. Pancreas scintigram rendered higher diagnostic informations when solitary or diffuse defects could be demonstrated. Diagnosis, on the contrary, was difficult or impossible in chronic pancreatitis, and inflammatory processes of the biliary tract.

3) Nineteen cases undergoing surgical operation and/or autopsy included primary pancreatic malignancy, metastatic cancer, pancreatic cyst, and acute and chronic pancreatitis, in which the collet diagnosis was possible in 13 cases, or approximately 68 per cent.

4) Subtracted pancreas scintigram or "double scan technique" was considered highly efficient in cases difficult to interpret.

Study of Vitamin B_{12} Binding Proteins in Gastric Juice by ^{57}Co, and ^{58}Co Labelled Cyanocobalamin: Discriminating Assay System Between Binder and Binder-B_{12} Complex

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It is known that, there are two kinds of vitamin B_{12}(B_{12}) binding proteins in gastric juice called as Intrinsic Factor(IF) that promote specific intestinal absorptio nof B_{12}, and non-IF binder that lacks IF activity. Assay of these proteins are carried out by the determination of the binding capacity of B_{12} with a radioactive B_{12} of a known specifis activity. Descriminating assay system is required for the analysis of difference between natures of the B_{12} free binder and the binder-B_{12} complex.

Methods:

Small amount of binder-$^{57}Co\cdot B_{12}$ complex was mixed with B_{12} free binder. After the fractionation, ^{57}Co radioactivity was determined as binder-B_{12} complex. Thereafter, $UB_{12}BC$ of each fraction was determined as B_{12} free binder by the charcoal assay, according to Gottlieb. $^{58}Co\cdot B_{12}$ was used for assay of $UB_{12}BC$ because ^{58}Co radioactivity could determine without influence from ^{57}Co radioactivity by scintillation spectrometry.

Results:

Molecular sizes of non-IF-B_{12} complex and IF-B_{12} complex obtained by gel filtration on Sephadex G-150, according to the Determann's method were 12×10^4 and 59000, respectively.

B_{12} free IF was eluated before IF-B_{12} complex. Molecular weight of IF was increased following formation of IF-B_{12} complex, but observed molecular size was inversely decreased. This phenomenon could be assessed by change of Stokes radius of IF molecule on binding of B_{12}.

The Stokes radius was calculated by desk computer (Programma 101, Olivetti-Underwood) according to Ackers' method, and albumin (36.1 A) was used as an internal standard. Thus, Stokes radii of IF was 36.4 A, and IF-B_{12} complex was 32.6 A. Therefore, 3.8 A of shrinkage of IF molecule occurred

on binding of B_{12}. Non-IF, 51.2 A and non-IF-B_{12} complex, 51.6 A revealed no significant change in Stokes radii.

Isolelectric fractionation of non-IF revealed 3 peaks, pI 2.9, 3.4, 4.0 and no shift of pI value was observed following bindinf of B_{12}. B_{12} free IF was microheterogenous with several pI values in the pH range of 4.7-5.7. The peaks in the IF-B_{12} complex were 0.04 pH units more acidic than in corresponding B_{12} free IF. The shrinkage in the Stokes radius and shift in the pI suggest conformational change of IF molecule on biding of B_{12}. The IF-B_{12} complex is known to be less susceptible to denaturation and digestion than the free IF. On the other hand, formation of IF-B_{12} complex is essential for intestinal absorption of B_{12}. Therefore, conformational change of the IF molecule following binding of B_{12}. Therefore, conformational change of the IF molecule following binding of B_{12} might play an important role in the promotion of intestinal absorption of B_{12}.

Experimental Studies of the Effect of X-Ray Irradiation to the Abdomen

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The experiments were performed to evaluate the effect of X-ray irradiation to the abdomen on gastrointestinal protein-losing in rabbits using ^{131}I-polyvinylpirrolidon.

Various effects occur in the gastrointestinal tract by X-ray irradiation to the abdomen. One of these is the protein-losing from the gastrointestinal tract. We already reported last year the rate of protein-losing in the feces and the change of the serum protein by irradiation.

In this paper, we will report the results of the difference of pathologic and microautoradiographic findings according to irradiation dose.

Methods:

The animals used are male rabbits ranging from 2.0 to 2.5 kg. The radiation apparatus is the linear accelator. The radioistotope used is ^{131}I-polyvinyl pirrolidon. The experimental animals were divided into 6 groups; the control group, single exposure groups (of 400, and 2,000 rads respectively) and 200 rads fractionated irradiation groups (of 2,000, 4,000 and 6,000 rads respectively) of total dose. The pathologic and microautoradiographic findings of the small intestine were investigated.

Results:

The main pathologic findings were the destroy, atrophy and vacuole degeneration of villus, bleeding and cell infiltration in mucosa. Those changes were recognized remarkably at upper small intestine, and strikingly in the groups of 2,000 rads single exposure. In 200 rads fractionated irradiation groups these were seen slightly, compared with in the groups of 2,000 rads single exposure.

The sensitized images microautoradiographically were found in the crypts and the enlarged laminae propiria (perhaps the central lacteal of villus). In addition, the changes were also in the ruptured blood vessels and edematic expanded submucosa.

Summary:

It is thought that the mechanism of the protein-losing from the gastrointestinal tract by X-ray irradiation is due to the following results. The villus is destroyed strikingly, simultaneously the capillaries and the lympatic vessels of villus are ruptured. The protein, therefore, ooze out from here into the intracellular cleft and the destroyed tissue, and then it is lost through the intestinale wall.