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.