

A Synopsis on Digestion-Absorption Tests

Masasuke MASUDA, M. D., Professor,

Kyoto Prefectural University of Medicine

“Malabsorption Syndrome” refers the disturbed conditions in the process of digestion and absorption of some nutrients. Varicus digestion-absorption tests or absorption tests have been employed in the diagnosis of malabsorption syndrome. They are classified by the species of nutrient used, or by the species of samples taken, or whether radioisotope is used or not.

Radioisotopic absorption test was introduced in 1949, when Rutenberg used ^{131}I -olive oil in dog experiments and when Stanley and Thannhauser applied it in human patients. In 1961, the first product of ^{131}I -triolein became available in Japan, by courtesy of Dai-nippon Pharmaceutical Co., upon our request. Since then, ^{131}I -triolein test for fat digestion-absorption has been performed in many cases.

It is my great privilege and honor to comment “A Synopsis on Digestion-Absorption Tests” on the basis of our over decade’s experience, as the President’s Speech of the 12th Annual Meeting of Japanese Society of Nuclear Medicine, 1972.

1) Test Meal: Because RI labeled digestion-absorption test itself is a type of tracer experiment, the cold meal should be chemically the same as the RI nutrient. The dosage of the cold meal should be around the upper limit (0.5 ml of peanut oil/kg b.wt.) of the physiological range of the food intake. The amount of RI is enough at a detectable

minimum.

2) Normal Value: In the authors’ method, the normal value of the fecal excretion ratio in ^{131}I -triolein test is settled under 2.0 % of administered dose. Over 4.1 % is considered to be pathological.

3) Digestion-absorption test as a RI labeled balance study: The fecal excretion method of RI digestion-absorption test is equal to RI labeled balance study. The advantages of RI digestion-absorption test are time-saving and no need of special facilities such as metabolic ward.

4) Pancreatic function: The combination of ^{131}I -triolein test and ^{131}I -oleic acid test does not give the pancreatic lipase activity. A combined use of ^{131}I -triolein test of the repeated ^{131}I -triolein test with sufficient amount of digestive enzyme preparation gives the pancreatic lipase activity.

5) Simultaneous fat and protein digestion-absorption test: In 1967, the authors originated the simultaneous fat and protein digestion-absorption test using ^{131}I -triolein and ^{125}I -RISA as a hot meal and loading peanut oil-gelatin mixture as a cold meal. The test meal consists of 0.5 ml/kg b.wt. of peanut oil and 0.5 g/kg b.wt. of gelatin and 80 ml of water as a cold meal and 50 μCi of ^{131}I -triolein and 25 μCi of ^{125}I -RISA as a hot meal.

With the aid of a pulse-height analyzer, the radioactivity of ^{131}I and ^{125}I of the fecal ex-

creta can be assayed independently. The advantages of this test are; (A) it is time-saving: digestion absorption functions of both fat and protein can be determined by a single test. (B) emulsifying agent (tween 80) is unnecessary. (C) the cold meal is quite similar to the normal meal, in terms of the composi-

tion and volume.

Simultaneous fat and protein digestion-absorption tests were performed in normal control group as well as in the cases having various malabsorption syndrome, with sufficient results.

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