between cancer and non-cancer patients. In leukocytes uptakes increased rapidly after 3 hours, reached to the maximum in 6 to 24 hours, and decreased thereafter. In this case uptakes in cancer patients were significantly less than those in non-cancer patients.

This was also the case in the animal experiments. 4-Nitroquinoline-N-oxide induced lung cancer was transplanted to the rats subcutaneously, and 2 weeks after 50 μCi/100g of ^{65}Zn was intraperitoneally injected. ^{65}Zn uptakes of leukocytes in tumor-bearing rats were less than those of normal rats.

In order to investigate zinc metabolism of mature leukocytes in peripheral blood, ^{65}Zn was added to the medium in the tubes containing blood cells, and after the incubation period ^{65}Zn uptake was determined. There was no difference of uptake of both cells between the normal individuals and cancer patients.

The organ distribution of ^{65}Zn in rats was as follows: uptake of the liver was most and followed the intestine, the pancrease and the spleen etc. In the tumor-bearing rats the liver took up more amount of ^{65}Zn than in normal controls.

Summing up these results, it is asumed that a decrease of zinc content of leukocytes in the cancer patients is due to a decrease of zinc incorporation in the growing process in the bone marrow.

Shifting to the Foetus of RI used for Investigation of Activities of Pregnant Women's Organs

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In case the radioisotope is used on pregnant women, in the domain of obstetrics, for the purpose of diagnosis, its influence not only on these women but the foetus may not be overlooked. To examine the shifting to the foetus of RI, administered to pregnant women is, in this sense, highly significant clinically.

Thus, the present writer undertook to investigate the shifting to the foetus of some radioisotopes, which are frequently administered to pregnant women, and conducted research of the subject matter with a view to obtaining an index to clarify the influence of radioisotope administration on the foetus.

Through the ear veins of white hybrid rabbits, about 3 kg each in weight, in the final stages of pregnancy, ^{99m}Tc-albumin 30 μCi, 300 μCi, 3 mCi, R^{131}ISA 0.3 μCi, 5 μCi, 100 μCi, ^{131}I-Hippuran 0.6 μCi, 10 μCi, and 50 μCi, respectively, were injected venously, and, by the incision of the womb of each rabbit through the passing of time, the foetus was taken out, and, then, the radioactivity of the organs of the parent rabbits was determined by using a γ-scintillation counter.

From each such experiment, it was known that, even if radioisotopes of such low concentration were used as are now practically used on the human body, the various regions of the foetus would be affected by radioactive substances to about the same proportions as would result from the administration of high-concentration radioisotopes.

Since the amounts used were extremely small, it was impossible, 24 hours after the administration, to measure such movement to various corporeal regions. No matter how short the duration of exposure was, it could not be held that the foetus was remained entirely unaffected, so far as the present experiments were concerned.

When it is deemed unavoidable to use

radioisotopes for determining the position of the placenta, full consideration will have to be given to the quantity of radioactivity in the body. According to Smith, the overall quantity of radioactivity in the body is 1 mCi of 99mTc-albumin, or 5 mrad, which corresponds to R131ISA 5 μCi.

Accordingly, it is seen that, in case of administration of radioisotopes to pregnant women, for the purpose, for example, of determining the position of the placenta, 99mTc-albumin, when it effect on the sexual glands and the foetus will have to be considered, 99mTc-albumin contains less radioactivity than R131ISA, which will at once mean a greater safety.

In the domain of obstetrics-gynecology, it is imperative that these factors be fully taken into consideration in considering the application of radioisotopes or the "nuclear medicine in obstetrics-gynecology".

Some Considerations on Radiation Doses from Administered Radioisotopes
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In Human Counter at Tokyo University the authors experienced for the past one year about 200 cases of whole body counting of the patients, who had been administered various radioisotopes for the clinical diagnosis. In not a few cases, the patients had been contaminated with the indifferent radioisotopes used in the previous examinations, and this pre-contamination much disturbed to evaluate the results of whole body counting. This is the apparent evidence of the two facts; firstly, lack in systematic administration of the radionuclides for the clinical diagnosis and, secondly, lack in consideration to the absorbed dose evaluation of the patients. As to the first point, it must again be suggested that, when a series of medical examinations are to be carried out with the same patient, the administration program should be made with special reference to (1) the quantity, (2) the effective half-life and (3) the gamma ray energy of the radioisotopes which are to be used. In regard to the point, the authors strongly emphasized that the absorbed dose evaluation should always be done with each patient. The authors suggested the practical effectiveness of the ICRP method of dose calculation for this purpose, especially because of its simplicity. The dose absorbed by the organ of reference after the oral administration is simply calculated by the equation: where

$$R \text{ (rem)} = 73.8 \left(\frac{q \, f_w \, \varepsilon \, T_{eff}}{m} \right)$$

q : quantity of radioisotope (μCi)
ε : average energy absorbed per dis-
 : effective half-life (days)
m : weight of the organ of reference (g)
 : fraction reaching organ of reference

en. cmfw cmfw cmfw cmf shrd cmfd mfw In case the radionuclide is uniformly distributed in the body, such as 22Na, the absorbed dose of the total body or the gonad can be calculated by the equation above by taking body weight as a value of m. The authors showed a table and a graph for practical use, by which the absorbed dose after 1μCi oral administration of important nuclides can easily be known. When the radionuclide is not uniformly absorbed, such as 131I, the critical organ dose and the gonad dose must be calculated respectively. The authors showed a table and a graph by which the dose received by several important organs can be known. The gonad dose can also be estimated roughly under the assumption that the rest of the radioisotope other than that deposited in the critical organ is distributed uniformly in the body, but it was also suggested that, for the more accurate evaluation, the dose within the transient period immediately after the ad-