sis and hemosiderosis accompanied with blood diseases. The Ciba laboratory's method was used to measure the urinary iron after the administration of desferrioxamine. Ferrokinetic study was carried out according to Huff's method. The iron deposition in biopsied liver specimen was graded after the Greenberg's criteria. Iron absorption was measured by giving 5 mg. ferrous sulfate labelled with ^{59}Fe.

Results: 1) Although each value of serum iron in liver diseases ranged widely, the average levels in each group were all higher than normal; in the order of acute hepatitis, cirrhosis and chronic hepatitis. Relation between SGPT and serum iron was as follows; In acute hepatitis, higher SGPT values showed higher serum iron levels. On the contrary, most subjects with liver cirrhosis showed high serum iron levels even in the subjects with low SGPT. No significant relationship was observed between both values in chronic hepatitis. 2) Markedly increased iron granules were found in iron overloaded disorders. Mild iron depostion was found in acute and chronic hepatitis. On the other hand, remarkable iron deposition was found in some cases of liver cirrhosis. 3) Six-hour urinary iron excretion after the i.m. injection of 500 mg. desferrioxamine was determined. Increased urinary iron excretion was found in liver diseases; the average levels in each group were all higher than normal; in the order of liver cirrhosis, chronic hepatitis and acute hepatitis. The data presented are interpreted as indicating that liver diseases, especially liver cirrhosis, are frequently associated with body iron overload. 4) Rather low iron absorption rate was observed in iron overloaded subjects. All cases of acute hepatitis except one were within normal range. Some cases of chronic hepatitis and cirrhosis showed increased iron absorption. 5) Red cell survival was measured by ^{51}Cr method. Slight to moderate shortening was observed in some cases in each group of liver diseases. 6) Ferrokinetics was performed in 2 cases of chronic hepatitis, 6 of cirrhosis and one of idiopathic hemosiderosis. Generally, slow decline of plasma iron disappearance was found in the subjects with high serum iron levels. Red cell utilization, however, was found to be normal in the same subjects. No remarkable uptake of iron by the liver as shown in well-established hemochromatosis was fuond in this study.

From these results, it was considered that the increased serum iron levels in acute hepatitis may not be due to increased iron absorption, but mainly due to ferritin iron caused by liver tissue destruction. On the other hand, high serum iron level and increased hepatic iron deposition shown in liver cirrhosis may be mainly the result of increased body iron store is the result of increased iron absorption. In chronic hepatitis, the factors in the both two diseases may be involved.

Synmposium IV. Diagnotic Use of RI in the Field of Gynecology

(Chairman) H. Fujimori, Osaka City Univ.

Diagnosis of the Uterine Cancer Using Radioactive Isotopes

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The diagnostic method for the uterine cancer using radioactive isotopes has many advantages as follows:

This is a non-operative method easy and simple to detect. The result is obtained quickly and objectively. Usually ^{32}P is

employed in this method. In our clinic ^{32}P is administered into the femoral artery retrogradely, saving RI to be needed. The concentration of ^{32}P at the local region is measured with a needle-type counter 2~3 hours after the injection. The accuracy of the diagnostic data is 90.7% for the cancer and 97.0% for the benign erosion.

Further developments of this method are due to the new device of RI and the detector.

Previously, a catheter-type micro G-M counter was used for internal detection of radioactivity. However, the application of this counter to clinical cases was limited because of such drawbacks as rapid deterioration due to radiation, high operation voltage and restricted sensitivity to high energy beta-rays such as ^{32}P.

Recent development on a semiconductor detector overcame these disadvantages. Taking notice of important characteristics of this detector, such as smallness, durability and low operation voltage, we made a Si p-n junction detector into a catheter-type one and investigated its utilization in the field of clinical medicine, such as circulation study, pulmonary study, and the detection of malignant tumor in the upper G-I tract and in the uterus.

The standard catheter-type semiconductor detector was completed in our laboratory, the outer diameter of which is about 3.2 mm and the length is about 120 cm. The smaller detector of 2.7 mm in diameter and special detector of 2.5 mm in diameter which is to be used for incorporation with a gastrofiberscope have also been developed.

All the basic characteristics of our detector were studied and investigated into, including noise level versus temperature and bias voltage; beta-ray sensitivity versus bias voltage; linearity of counting rate to the concentration of radioactive sources; and isoresponse curve. The noise increased with the rise of temperature and the increase in bias voltage, but it could be easily discriminated by proper setting of the discriminator, provided 45°C in temperature and 60 V in reverse bias voltage. The counting rate increased with the increment of reverse bias up to about 10 V, but it became nearly independent of the reverse bias beyond this voltage. The sensitivity of our detector is about 5 cpm/mμCi/ml for ^{32}P point source in the air. It was shown that the catheter-type semiconductor detector using a end-window-type senser has a relatively narrow sensitive geometry in forward direction.

The reverse bias voltage of some 20 volts is fed to the detector placed in the human body through a series resistor of about 20 MΩ provided outside the human body, the leakage current through the body will be only about 1 μA. According to Starmer et al., a current of 180~200 μA through the human body causes a ventricular fibrillation but a flow of less than 10 μA gives no hazard. Thus, with respect to electric shock, this detector proves to be quite safe for human applications.

The Diagnostic Use of Radioactive Phosphorus for Cancer of the Uterine Cervix

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In general, the diagnosis of cancer of the uterine cervix is comparatively easy by means of bimanual and speculum examination with smearcell test or histologic examination for confirmation. In the early diagnosis of cancer of the cervix, however, it is necessary for additional diagnostic methods to supplement the gynecological examination.

The diagnostic methods of cancer utilizing ^{32}P-uptake is based on the differencial ab-