Diagnosis of primary hepatocellular carcinoma by means of the estimation of α-fetoprotain and computerscintigraphy

Y. Yumoto, T. Namba, Y. Tanaka and K. Kosaka

First Department of Internal Medicine, Okayama University Medical School, Okayama

The serum concentration of α-fetoprotain in 5 of 20 patients of primary hepatocellular cartinoma showed from 5.0 ng/ml to 240 ng/ml, implying that there was primary liver cartinoma producing very little amounts of α-fetoprotain. Those were classified into the first or the second type of Edmondson's classification of primary hepatocellular cartinoma. When serum concentration of α-fetoprotain (S-αf) were measured weekly for up to 6 months in the patients with hepatitis or livercirrhosis, Serum α-fetoprotain increased at the time of decreasing in serum glutamic pyruvic transaminase (SGPT) in 5 of all 19 cases with liverdiseases; 3 cases with fluminant hepatitis, 2 cases with subacute hepatitis, 5 cases with chronic c hepatitis, 5 cases with chronic hepatitis with sublobular hepatic necrosis and 2 cases with livercirrhosis A′. Serially determination of S-αF of those cases were classified into 5 types. When leveles of serum concentration of Australia antibody were increased promptly in clinical course ina case with chronic hepatitis (active form), the dane particles (42 nm. in diameter) of Au-antigen appeared in the serum of the patient at the time of transiently elevated in SGPT under electolomicroscopy.

After few weekes, values of SGPT were transiently elevated in acompany with beeing decreased the values of Au-antigen. Then the Auantigen-antibody complexes were recognized electolonmicroscopycally in his serum. Half month later, S-αf increased at the time when leveles of SGPT decreased, and the small particles of Au-antigen (20 nm. in diameter) reappeared in the serum.

The dane particles (42 nm. in diameter) of Au-antigen made hepatocellular necrosis, thereafter regeneration of the liver came in acompanied with production of α- fetoprotain.

Twenty of 32 cases of patients with hepatocellular carcinoma were diagnosed by liverscintiphotography with ^{198}Aucolloid or ^{99m}Tcsulfer colloid, but one of 2 cases who were not diagnosed by scintiphotography, was able to make diagnosis of hepatocellular carcinoma by means of serially detumination of S-αf.

Another case was able to confirm by means of subtraction scintigram with computer scintigraphy. A rate of correxct diagnosis of liver cancer raised by serially determination of S-αf and hepaticscintiphotography calculated with a computer, simultaneously.

A Modified Double Antibody Procedure for Radioimmunoassay of α-fetoprotein

I. Iwasaki, M. Hasegawa and H. Yoshioka

Second Department of Internal Medicine, Okayama University Medical School, Okayama

A modified double antibody procedure for radioimmunoassay of α-fetoprotein was applied to clinical investigation.

In original method both 1st and 2nd immunoreactions needed 24 hours for incubation.

By shortening of the incubation time from 24 to 10 hours, the percentages of binding bodies produced in both reactions were increased.

Investigations under the modified conditions as follows—the 1st reaction time was 24 hours at

4°C and the 2nd reaction time was 2 or 4 or 8 hours at 37°C—disclosed the same results that of the original methods.

When the incubation time and the temperature of the 1st reaction were changed from 24 to 2 or 4 or 8 hours and from 4°C to 37°C, the incubations for 4 or 8 hours gave the same results as the original method of 24 hours incubation.

And the conbination of the 1st reaction for 10 hours at 37°C and the 2nd reaction for 10 hours at 37°C was most suscetible.

As the results the rapid measurement of α-fetoprotein was capable by this modified method.

Clinical results with this method were as follows:

1) of 12 patients with primary hepatoma 11 were more than 320 mμg/ml and only 1 was negative.

2) of 9 patients with metastatic liver cancer only 1 was slightly positive and others were negative.

3) of 3 with acute hepatitis 1 was positive.

4) of 8 with chronic hepatitis 2 were positive.

5) of 11 with liver cirrhosis 1 was positive.

6) of 2 pregnants 2 were positive.

7) of 15 with cancer in various organs except liver, of 5 with leukemia and of 3 with malignant lymphoma none was positive.