Diagnosis of primary hepatocellular carcinoma by means of the estimation of α-fetoprotein and comput erscintigraphy

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

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

The serum concentration of α-fetoprotein in 5 of 20 patients of primary hepatocellular carcinoma showed from 5.0 ng/ml to 240 ng/ml, implying that there was primary liver carcinoma producing very little amounts of α-fetoprotein. Those were classified into the first or the second type of Edmondson’s classification of primary hepatocellular carcinoma. When serum concentration of α-fetoprotein (S-αf) were measured weekly for up to 6 months in the patients with hepatitis or liver cirrhosis, Serum α-fetoprotein increased at the time of decreasing in serum glutamic pyruvic transaminase (SGPT) in 5 of all 19 cases with liver diseases; 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 liver cirrhosis A’. Serially determination of S-αF of those cases were classified into 5 types. When levels of serum concentration of Australia antibody were increased promptly in clinical course in a 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 weeks, values of SGPT were transiently elevated in acompany with being decreased the values of Au-antigen. Then the Auantigen-antibody complexes were recognized electolonmicroscopically in his serum. Half month later, S-αf increased at the time when levels 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 accompanied with production of α-fetoprotein.

Twenty of 32 cases of patients with hepatocellular carcinoma were diagnosed by liverscintigraphy with 198Au colloid or 99mTc sulfur colloid, but one of 2 cases who were not diagnosed by scintigraphy, 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 correct diagnosis of liver cancer raised by serially determination of S-αf and hepatic scintigraphy 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 combination of the 1st reaction for 10 hours at 37°C and the 2nd reaction for 10 hours at 37°C was most susceptible.

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 μg/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 pregnant 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.