Serum Alphafetoprotein in Bladder Carcinoma

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Key Words

Alphafetoprotein
Bladder carcinoma
Bilharziasis

Abstract

112 cases, of varying ages, which were diagnosed as having carcinoma of the bladder by cystoscopy and biopsy from the tumor, were investigated for the presence of alphafetoprotein (AFP) in the sera. 59 (52.6 %) out of the total, showed positive results, and no false positive results occurred. Radioimmunoassay was capable of increasing the positivity rate still further. All of the cases were proved by liver scan and laparotomy to be free of metastasis, but all had bilharziasis during childhood, in which there is no factor affecting the liver that is responsible for the release of AFP, as the only species of bilharziasis present in Iraq is that of hematobium.

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Introduction

Alphafetoprotein (AFP) is a normal constituent of fetal serum [Gitlin], but the levels are low at birth and subsequently fall rapidly. The conditions in which elevated AFP in the sera were found, were embryonic tumors of the ovary and testis, primary hepatoma [Abeley], secondary deposits in the liver, hepatitis, cirrhosis, biliary atresia and others. Bladder carcinoma in Iraq is the first common tumor affecting males [Alsalem]. The disease in more than 3A of the total number of cases is due to previous infestation with bilharziasis [Alsalem] which is due to hematobium species. Thus the disease is much more common in the middle and lower parts of the country than in the northern part. The present report is concerned with findings in 112 cases with bladder carcinoma that had been studied by extensive clinical, histological, and biochemical investigations including AFP test.

Materials and Methods

Sera were made available from different hospitals in the country. They all had hematuria and loss of weight without any

other genitourinary or general symptoms of the disease. Counter current electrophoresis as had been described by Kohn was used for the detection and identification of AFP in the sera, which was performed on cellulose acetate (CAM) supplied by Shandon (England). The pattern of depressions were described also by Kohn. A series of experiments with standard from various commercial sources, indicated a sensitivity of 220–1000 ng/ml or even higher. Using AFP control provided by Dakopatts, the presence of 220 ng/ml could still be clearly demonstrated. The positive control sera were calibrated and checked against standard sera and pure AFP from Behring.

Liver function tests (on all cases), liver scan (on another ten cases), and laparotomy (on 49 cases) were done in the positive AFP cases to exclude any liver secondaries which many may regard as being responsible for AFP production.

Results

AFP was detected in 59 (35 males, 24 female) out of the total 112 cases (52.6%). Their ages were ranging between 48–69 years (table J). Histopathological examinations of liver specimens obtained at laparotomy (in 49 cases out of the total 59 positive AFP cases in the series) showed no liver secondaries. In the remaining ten cases liver scan was normal. In all the cases liver function tests were normal. All the 59 positive AFP cases had previous childhood history of infestation with bilharziasis.

At laparotomy, the tumor was found resectable in 41 cases and unresectable in the remaining eight cases referred for surgery. Biopsy from the bladder obtained by cystoscopy in the 59 cases showed 51 cases with squamous cell carcinoma and eight with transitional cell carcinoma.

Table I. Clinic and histopathology of 59 bladder carcinoma positive AFP cases.

Sex incidence

Age (years)

Complaint

Duration of symptoms

male 35 female 24

40–49: 3 cases 50–59: 22 cases

Hematuria and loss of weight in all 59 cases 1 year, 7 cases 2 year, 21 cases

60 + , 34 cases 2+ year, 31 cases

Childhood history of bilharziasis in all cases 59 was present Hepatomegaly nil in all 59 cases

Liver function were normal in all 59 cases Histopathology of bladder biopsy from cystoscopy

Operability

squamous cell carcinoma, 51 cases inoperable, 10 cases

transitional cell carcinoma, 8 cases resectable, 41 cases

unresectable, 8 cases

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Discussion

The hypothesis regarding the role of AFP in fetal development [Smith], its presence in normal human sera [Ruoslahti et al] and possible reason for its corresponding reappearance in abnormal amounts in malignant hepatoma, teratocarcinoma [Smith], carcinoma of stomach [Alpert et al], and other conditions has been extensively reviewed. The previous study in Iraq [Alsabti], showed positive AFP in 141 cases with bilharziasis diagnosed clinically and by intradermal tests and ova in mid stream urine samples, without any liver involvement that had been excluded by liver scan in all cases. Thus, in this study, a correlation was made between AFP and bilharziasis, infestation of which was present in all case histories.

The most important point which must be raised in this study, is the failure of the test as a screening method, not only in our country, but in all other endemic areas of bilharziasis in the world.

We made an effort to explain these results by assuming that bilharziasis may cause secondary liver fibrosis which may also be responsible for AFP production. Thus, we studied the gammaglobulin level in the sera, which increased in only eleven cases, and the presence of autoantibodies to liver homogenate in only three cases, out of a total of 59 cases. Unfortunately, this supposition was proved by the following factors to be untrue:

Studies in Iraq [Shamma] showed that liver fibrosis needs longer time, which did not correspond with the short duration of bilharziasis in the previous study;
normal liver scan;

(3) Studies on pathogenesis [Shamma] showed no liver changes. In conclusion, these results may dispute Gutlin's theory which emphasises that the embryonic and yolk sac are the only tissues capable of AFP synthesis, but they will not play a greater role in screening in our endemic country, unless we eradicate the disease of bilharziasis.

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