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ORIGINAL RESEARCH

Assessment of usefulness of AFP as a tumor marker in cases of HCC

A SATYA SAI VENKATA LAKSHMI
INTERN, Apollo Institute Of Medical Sciences and Research, India
EMAIL: ssvlakshmiarepalli@gmail.com

D RAGASRI MEGHANA
Final year MBBS Student, Kakatiya Medical College, India
ragasri02@gmail.com
Dr Zaid Munir
Graduated(done MBBS)
Rashid Latif Medical College Lahore
Pakistan
drzaidmunir815@gmail.com
Amro Musa Mohamed Elamin Alam Alhouda
University of Khartoum Faculty of Medicine
amromusa19@outlook.com
ALI ABDALLA ALI OSMAN
Year of graduation: 2016
Medical school: University of Khartoum, Faculty of Medicine, Sudan
Email: aliabdalla10@hotmail.com
Nargis Tabasom Mateen
Graduate
Lahore Medical and Dental College, Pakistan
nargistmateen@gmail.com
Juan Carlos Batlle
Country: Dominican Republic
Medical School: Universidad Iberoamericana (UNIBE)
Email: juancabatlle@gmail.com
Dr.Ayush Neupane
Medical officer, Nepal
bonnetan.ayn@gmail.com
Corresponding author: NargisTabasomMateen, Graduate, Lahore Medical and Dental CollegePakistan, nargistmateen@gmail.com

ABSTRACT

Background: Hepatocellular carcinoma (HCC) is the fourth leading cause of cancer-related death worldwide. The present study was conducted to assess usefulness of AFP as a tumor marker in cases of HCC.

Materials & Methods:72 hepatocellular carcinoma patients of both genders were enrolled. 5 ml of venous blood was taken and level of AFP was measured.

Results: Out of 72, males were 42 and females were 30. There were 30 HBV, 12 HCV, 10 HBV and HCV positive, 7 HBV and HCV negative, 5 AFB1 positive and 8 HBV and AFB1 positive. AFP positivity was seen in 18, 3, 8, 2, 3 and 4 respectively. The mean AFP titre level (ng/ml) was 504.2, 482.6, 572.4, 461.2, 476.2 and 224.7 respectively. The difference was significant ($P< 0.05$).

Conclusion: Overall positivity pattern of AFP in HCC does indicate that higher levels of AFP are observed with hepatitis virus positivity, especially with HBV.
Key words:cancer, hepatocellular carcinoma, tumour

Introduction

Hepatocellular carcinoma (HCC) is the fourth leading cause of cancer-related death worldwide. The prevalence of HCC in autopsied Indians is low, and varies between 0.2% and 1.9%.In the ordinary diagnostic process of HCC, a space-occupying lesion in the liver is first detected by imaging modalities such as ultrasonography and then confirmed by dynamic CT or MRI with contrast media.[1] Typical HCC shows hypervascularity in the arterial phase and washout of contrast media in the portal-venous phase. The final diagnosis was made pathologically when a patient receives percutaneous biopsy, hepatic resection, or liver transplantation.[2]

Alphafetoprotein (AFP) has served as a diagnostic test for HCC since the 1970s, when most patients with HCC were diagnosed at an advanced stage with clinical symptoms.[3]Alpha-fetoprotein (AFP), a 70-KDa glycoprotein tumor marker, is increased in the majority of patients with HCC and other gastrointestinal tumors. AFP is normally produced during fetal development by the liver and yolk sac. After birth, the levels drop off rapidly, and by the second year only trace amounts are detectable in serum.[4]Concentrations higher than 500 ng/ml can be confirmatory in that situation. Nowadays quite a few small HCCs (e.g., 3 cm or smaller) can be detected owing to advances in imaging modalities, and it is known that significant numbers of small HCCs do not secrete a diagnostic level of AFP.[5] Furthermore, AFP levels are elevated both in patients with HCC and in those with chronic liver diseases, and there is a wide overlap between the two groups. Thus, the role of AFP as a diagnostic test is getting smaller.[6]The present study was conducted to assess usefulness of AFP as a tumor marker in cases of HCC.

Materials & Methods

The present study comprised of 72 hepatocellular carcinoma patients of both genders. The consent was obtained from all patients.

Data such as name, age, gender etc. was recorded. Sociodemographic characteristics, diet, cigarette smoking habits, consumption of alcohol, betel nut chewing, their medical and surgical history, and any family history of HCC were recorded. 5 ml of venous blood was taken and level of AFP was measured. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 72		
Gender	**Male**	**Female**
Number	42	30

Table I shows that out of 72, males were 42 and females were 30.

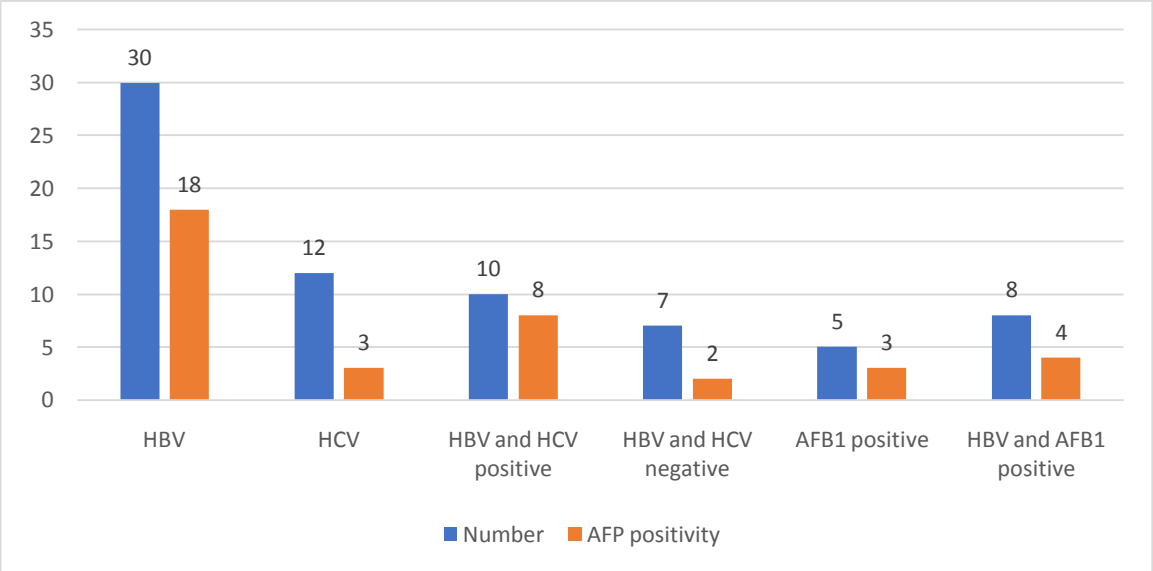
Table II Alpha-fetoprotein positivity profile in hepatocellular carcinoma

Parameters	Number	AFP positivity	Mean titre	P value
HBV	30	18	504.2	0.01
HCV	12	3	482.6	
HBV and HCV positive	10	8	572.4	

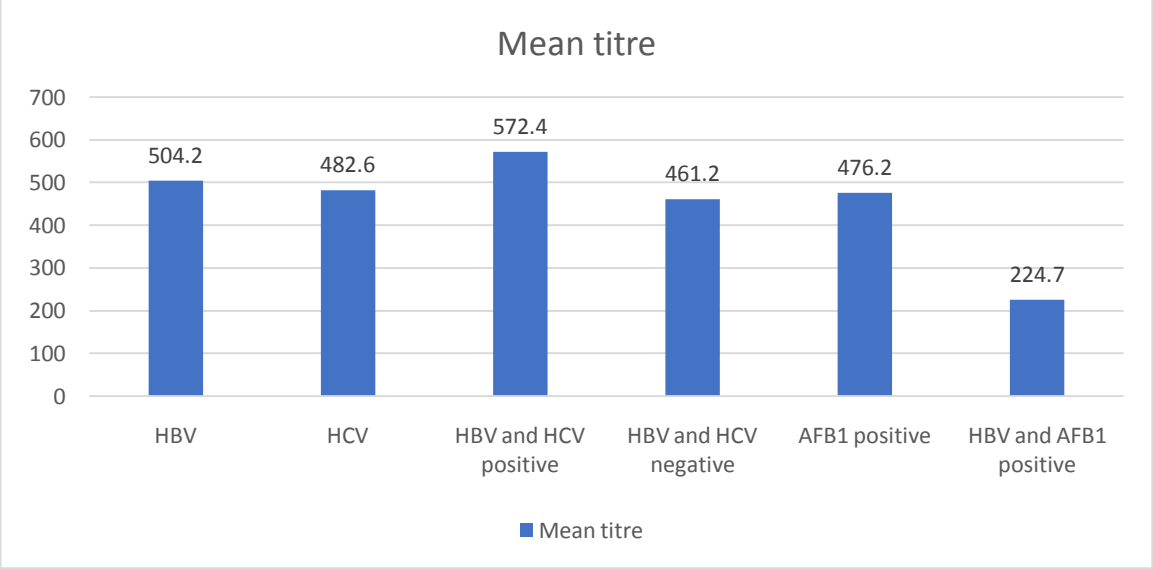
HBV and HCV negative	7	2	461.2	
AFB1 positive	5	3	476.2	
HBV and AFB1 positive	8	4	224.7	

Table II, graph I, II shows that there were 30 HBV, 12 HCV, 10 HBV and HCV positive, 7 HBV and HCV negative, 5 AFB1 positive and 8 HBV and AFB1 positive. AFP positivity was seen in 18, 3, 8, 2, 3 and 4 respectively. The mean AFP titre level (ng/ml) was 504.2, 482.6, 572.4, 461.2, 476.2 and 224.7 respectively. The difference was significant (P< 0.05).

Graph IAlpha-fetoprotein positivity profile in hepatocellular carcinoma



Graph IIAlpha-fetoprotein positivity profile in hepatocellular carcinoma



Discussion

AFP may be useful in the diagnosis and follow-up of cases of HCC, although increased levels are associated with malignancies other than primary HCC.[7] Studies suggest that in patients thought to have HCC on clinical grounds, AFP levels >400 ng/ml should strongly confirm the presence of HCC by a tissue diagnosis.[8] Some patients with primary hepatic cancer will have

normal AFP levels, and normal or moderately elevated levels should not exclude a diagnosis of HCC, although the usefulness in follow-up of patients under treatment for hepatoma has not been examined systematically.[9] Thus, this marker is believed to be useful in following the clinical course of persons with HCC.[10] It has been suggested that the AFP values are more likely to be elevated with the stage of such cancers and are of prognostic value to check the efficacy of treatment of HCC. Levels of serum AFP are widely used for HCC screening in patients with chronic liver disease (CLD). The relationship between viral etiology and AFP levels in HCC is still unclear.[11,12]The present study was conducted to assess usefulness of AFP as a tumor marker in cases of HCC.

In present study, out of 72, males were 42 and females were 30.Murugavelet al[13]verified the usefulness of alpha-fetoprotein (AFP) as a tumor marker and analyzed the influence of viral etiology on AFP levels in HCC. Of a total of 1012 cases with liver disease, 202 were investigated for the presence of AFP (142 HCC cases, 30 cirrhosis cases, and 30 chronic liver disease (CLD) cases). In addition, serum samples from 30 healthy patients, 30 hepatitis B surface antigen (HBsAg) carriers, and 30 acute viral hepatitis cases were included as controls. AFP was quantitatively determined using a commercial ELISA (Quorum Diagnostics, Canada). Out of the 142 HCC cases screened for AFP, aflatoxin B1 (AFB1) detection was carried out in 38 HCC cases using an in-house immunoperoxidase test. Results: In HBV and HCV co-infected HCC cases, the AFP positivity was 85.7%. In HBV aloneassociated HCC, the positivity was 62.9%, and 54.5% of AFB1 positive HCC cases showed AFPpositivity. In HBV and HCV negative HCC cases, the positivity was 20.5%, and in HCV-associated HCC it was 17.6%. The HBV/HCV co-infected group and HBV alone positive HCC cases had significantly elevated levels of AFP. When AFP positivity was analyzed based on the marker profile of HBV, 89.7% of AFP positive cases were HBV-DNA positive.

We found that there were 30 HBV, 12 HCV, 10 HBV and HCV positive, 7 HBV and HCV negative, 5 AFB1 positive and 8 HBV and AFB1 positive. AFP positivity was seen in 18, 3, 8, 2, 3 and 4 respectively. The mean AFP titre level (ng/ml) was 504.2, 482.6, 572.4, 461.2, 476.2 and 224.7 respectively. Tateshi et al[14] in their research studies were included when they showed sensitivity and specificity for HCCs 5 cm or smaller and recruited only patients with chronic hepatitis or liver cirrhosis as control. We assessed diagnostic odds ratios (DORs) for the evaluation of diagnostic accuracy of tumor markers and positive likelihood ratios (LRs+) to find the optimal cutoff value. DORs and LRs+ were combined according to the random effect model. Seventeen articles on three tumor markers—AFP, des-gamma-carboxyprothrombin (DCP), and *Lens culinaris* agglutinin-reactive fraction of AFP (AFP-L3)—were enrolled after full-text evaluation. AFP was inferior to DCP and AFP-L3 in both DOR (4.50 vs. 8.16 and 10.50) and area under the ROC curve (0.647 vs. 0.688 and 0.695). Optimal cutoff values that provide the best LR+ were 200 ng/ml for AFP, 40 mAU/ml for DCP, and 15% for AFP-L3. Diagnostic accuracy of AFP in small HCC was substantially limited. Surveillance including other tumor markers with optimal cutoff value should be conducted to confirm the efficacy of the policy.

Conclusion

Authors found that the overall positivity pattern of AFP in HCC does indicate that higher levels of AFP are observed with hepatitis virus positivity, especially with HBV.

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