

# Alpha Fetoprotein and Platelets as Useful Markers for Child Pugh Classification in Male Egyptian Patients With Hepatitis C Virus

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**Background:** Serum level of alpha-fetoprotein (AFP), variably increased during liver damage, have been suggested to be of prognostic importance in acute liver failure (ALF), higher values being combined with improved outcome. The thrombocytopenia has a negative impact on the evolution of the disease.

**Subject and methods:** Cross sectional study including 60 patients was done at National liver institute in Egypt from the period of January 2013 till March 2013. Patients enrolled in the study were known cases of chronic HCV liver disease and were known degree of child pugh classification. Demographic data such as age and gender were recorded. Detailed clinical history and examination were carried out and recorded, Complete blood count, liver function test, total protein, Albumin/Globulin (A/G) ratio, serum Albumin, HBs Ag, anti HCV, ultrasound whole abdomen and CT scan. Alpha fetoprotein and Platelets were determined in sixty HCV infected patients classify into three Groups: Group I (grade A child pugh classification n=20), Group II (grade B child pugh classification N=20), Group III (grade C child pugh classification N=20).

**Results:** serum alpha fetoprotein has significant positive correlation with liver damage in HCV infected patients and Platelets show significant negative correlation with liver damage in HCV infected patients.

**Conclusion:** AFP and Platelets levels may serve as useful markers for detection the grade of child pugh classification in chronic HCV infected male patients and useful markers for follow up the liver damage.

**Key words:** Alpha Fetoprotein, Platelet, chronic HCV, child pugh classification.

## I. Introduction

Serum concentrations of alpha-fetoprotein (AFP), variably elevated during liver injury, have been suggested to be of prognostic importance in acute liver failure (ALF), higher values being associated with improved outcome (1). Thrombocytopenia in patients with chronic hepatitis C may be the result of several factors: bone marrow inhibition, the decrease of liver thrombopoietin production and an autoimmune mechanism (2). In adult life, increased serum concentrations of AFP are seen in many patients with hepatocellular carcinoma (3), with modest increases observed in some patients with chronic hepatitis (4). Following liver injury, an increased AFP level seems to be associated with hepatic regeneration (5), possibly because immature "hepatoblasts" have features resembling those of fetal hepatocytes. The thrombocytopenia has a negative impact on the evolution of the chronic HCV disease, mainly in the advanced stages, when the platelet number falls below 50,000/ $\mu$ L (6). Among the haematological derangements in chronic hepatitis C, the decrease of platelet number seems to be the most common (7-9). In medicine (gastroenterology), the Child-Pugh score (sometimes the Child-Turcotte-Pugh score) is used to assess the prognosis of chronic liver disease, mainly cirrhosis. Although it was originally used to predict mortality during surgery, it is now used to determine the prognosis, as well as the required strength of treatment and the necessity of liver transplantation. The purpose of the present study is to detect that the AFP and Platelets levels may be used as useful markers for detection the grade of child pugh classification in chronic HCV infected male patients. Dr C.G. Child and Dr J.G. Turcotte of the University of Michigan first proposed the scoring system in 1964. (10) It was modified by (11).

## II. Materials And Methods

This study is a descriptive cross-sectional one was done in The National liver institute in Egypt from attendants of outpatient clinic and from inpatients in the period between January 2013 till March 2013. 60 patients were enrolled in the study with response rate were 72%. The samples of this study were possessed from National liver institute in Egypt. This work was carried out to detect that alpha fetoprotein and platelets can be used as useful markers for detection the grade of child pugh classification in Egyptian male patients with hepatitis C virus. The patients in this study were completely diagnosed with Chronic HCV, Data such as age and gender were detected. Blood samples for the measurement of Alpha fetoprotein (AFP) and platelets were determined in 60 patients with chronic HCV. Alpha fetoprotein measurement by The electrochemiluminescence immunoassay "ECLIA" Cobas e 601 immunoassay analyzers. Cobas, Roche and platelet by using automated blood measurements for platelets counts performed using an XE2100 (Sysmex,

Japan), that 60 patients were divided into three groups : Group I: chronic HCV patients with class A classification (n = 20). Group II: chronic HCV patients with class B classification (n = 20) . Group III: chronic HCV patients with class C classification (n = 20) . All patients were diagnosis by Ultrasound and CT by physicians to detect the type of child pugh classification . Inclusion criteria were all patients with chronic HCV infection without cigarette smoking ,alcohol drinking and HBV infection .

**Ethical consideration**

Informed consent was taken from all participants. Each participant has the right to accept or refuse participation after explaining the objectives. Confidentiality of collected data was guaranteed to participants .The research have been approved by institutional review board of national liver institute ,Cairo.

**III. Result**

The results show that in the group( 1) of chronic HCV with grade A classification of 20 patients and with median AFP : 10.7 , andmean platelets:175.2 , S.D : ± 54.6with mean age of that group was (44.2years±13.2). The results show that in the group (2) of chronic HCV with grade B classification of 20 patients and with Median AFP:19.5mean platelets: 129.8 , S.D : ± 81.3with mean age of that group was (46.2years±13.3) . The results show that in the group(3) of chronic HCV with grade C classification of 20 patients and with median AFP: 200.7, mean platelets: 114.4, S.D : ± 37.2 with mean age of that group was (42.2years±9.1) . From the study it shows that higher level of AFP with the progression of child pugh classification of liver cirrhosis with highest level with Grade C in that classification. This study shows also lower level of Platelets count with the progression of child pugh classification of liver cirrhosis with lowest level with Grade C in that classification.

**Table (1) . Demographic characteristics of the study groups**

| Groups                        | Group I<br>(Child A)<br>N=20 | Group II<br>(Child B)<br>N=20 | Group III<br>(Child c)<br>N=20 | Statistically significant | P value       |
|-------------------------------|------------------------------|-------------------------------|--------------------------------|---------------------------|---------------|
| Age Mean (Standard Deviation) | 44.2(13.2)                   | 46.2 (13.3)                   | 42.2(9.1)                      | F test= 0.553             | P=0.576<br>NS |

**Table (2) Data Evaluation of AFP values among study groups**

|                         | Group I<br>(Child A)<br>N=20 | Group II<br>(Child B)<br>N=20 | Group III<br>(Child c)<br>N=20 |
|-------------------------|------------------------------|-------------------------------|--------------------------------|
| Alpha fetoprotein level |                              |                               |                                |
| Max                     | 56                           | 90.3                          | 881.5                          |
| Min                     | 1.1                          | 0.1                           | 3.8                            |
| Median                  | 10.7                         | 19.5                          | 200.7                          |

Kruskalwallis test F test -52.8 P= 0.000 HS

**Table (3) Data Evaluation of Platelet values among study groups**

|           | Group I<br>(Child A)<br>N=20 | Group II<br>(Child B)<br>N=20 | Group III<br>(Child c)<br>N=20 |
|-----------|------------------------------|-------------------------------|--------------------------------|
| Platelets |                              |                               |                                |
| Max       | 22                           | 393                           | 157                            |
| Min       | 73                           | 72                            | 61                             |
| Mean (SD) | 175.2(54.6)                  | 129.8( 81.3)                  | 114.4(37.2)                    |

F test =-42.2 P= 0.000 HSKruskalwallis test

**IV. Discussion**

Alpha-fetoprotein (AFP) is the standard serum tumor marker utilized in the evaluation of suspected hepatocellular carcinoma. However, increased serum concentrations of AFP might be found in chronic hepatitis and liver cirrhosis, as well as in other tumor types e.g, germ cell tumors (12) .There can be a transitory elevation of AFP in patients with cirrhosis and exacerbations of infectious hepatitis (13).Alpha-fetoprotein (αFP) is a protein of fetal component produced during the embryonic period by the visceral endoderm of the gestational sac and, later on, by the liver. Its re-expression in patients with HCC has been described for over 40 years. Some studies have demonstrated that the presence of elevated levels of αFP in patients with LC is a risk factor for the development of HCC,thus suggesting that increased αFP-production in patients with LC might reflect,

largely and abnormal or altered liver cell regeneration. High  $\alpha$ FP serum levels have been found in 60–70% of patients with HCC; nevertheless, there are other causes of increased levels, such as cirrhosis, lung cancer, biliary cancer, gastric cancer, pancreatic cancer, teratocarcinoma of the testis, spherocytosis and tyrosinemia(14). This study shows that higher level of AFP with the progression of child pugh classification of liver cirrhosis with highest level with Grade C in that classification. In agreement with a study by (15) shows moderately elevated alpha fetoprotein among nonneoplastic liver disorders e.g viral hepatitis and this finding was reported to decrease survival and the level rarely exceed 500 ug/L, we speculate that hepatic regeneration after widespread hepatic necrosis after viral infection or alcohol abuse involves proliferation of undifferentiated liver cell such cell have prove to be cause of alpha fetoprotein which is implicated in hepatic carcinoma development . In agreement with this study a study by (16) shows community in which HBV and HCV infection is hyperendemic demonstrated that HCV infection is strongly associated with thrombocytopenia and that thrombocytopenia is also strongly associated with hepatocellular damage and hepatic fibrosis. This means that it is advisable to further check the hepatic condition, especially for HCV infection, in patients with thrombocytopenia. Whether thrombocytopenia is a good indicator for predicting the progression of viral hepatitis needs further study. Chronic hepatitis C is associated with a variable degree of thrombocytopenia . As the disease advances , the platelets count decreases . Several potential mechanisms can contribute to thrombocytopenia in chronic HCV infection, including accelerated platelets clearance due to an immune complex disease or a decreased platelets production due to direct marrow suppression, data demonstrates that chronic hepatitis C may be associated with variable degrees of thrombocytopenia. In most cases, both a central (bone marrow suppression) and a peripheral (platelets antibodies) mechanisms are involved (17). This study shows lower level of Platelets count with the progression of child pugh classification of liver cirrhosis with lowest level with Grade C in that classification. The thrombocytopenia has a negative impact on the evolution of the disease, mainly in the advanced stages, when the platelets number falls below 50,000/ $\mu$ L(18).

## V. Conclusion

\* The study suggests that serum alpha fetoprotein has significant positive relation with liver damage in male Egyptian patients with hepatitis C virus and Platelets shows significant negative relation with liver damage in male Egyptian patients with hepatitis C virus . AFP and Platelets levels may serve as useful markers for detection the grade of child pugh classification in chronic HCV infected male patients and useful markers for follow up the liver damage.

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