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Serum micro RNA 143 as a potential biomarker for the diagnosis of hepatitis C virus related hepatocellular carcinoma

Essam Alaaeldin Elzoheiry, Ahmed Mohamed El-Gohary, Ahmed Elsayed Zeid, Mohamed Eid Ibrahim and Fatma Ibrahim Dewedar
Alexandria University, Egypt

Background: Hepatocellular carcinoma is the 5th most frequently diagnosed cancer worldwide, and is the 2nd leading cause of cancer-related death in the world. HCC has a poor prognosis and most patients die within 1 year of diagnosis. Early recognition of the onset of HCC would help to select more effective therapies for patients leading to a better prognosis and life span. Though the measurement of AFP serves as an important tool in screening of HCC, some reports have indicated that it has limited utility of differentiating HCC from benign hepatic disorders. So, the development of effective marker for the diagnosis of HCC could have an impact on HCC-related cancer mortality. MicroRNAs are reported as a group of small non-coding RNAs that can function as endogenous RNA interference to regulate expression of the targeted genes.

Aim: The aim of this work is to study serum miR-143 expression level in patients with HCV-related HCC.

Methods: The present study was conducted on 60 subjects who attended the main Alexandria University Hospital during the period from April 2016 to the end of July 2016 and the subjects were divided into Group (A): 30 patients with HCV-related cirrhosis with HCC, Group (B): 15 patients with HCV-related cirrhosis without HCC and Group (C): Healthy subjects as control. Total serum RNA was extracted with small RNA enrichment followed by reverse transcription real time PCR. Expression of miR-143 in the serum of all subjects was obtained using the comparative cycle threshold (CT) method ($2^{-\Delta\Delta CT}$) after normalization for the expression of Syn-cel-miR-39 mi script miRNA mimic as control. MiR-143 expression levels were then compared in different groups.

Results: The mean serum miR-143 levels were significantly higher in cirrhotic patients without and with HCC than in healthy subjects (1.69±0.64 and 13.0±6.23 vs. 0.56±0.29 respectively) and in patients with HCC than in patients without HCC (Kruskal Wallis test, x^2=49.408, P<0.001). The mean serum miR-143 levels were significantly higher in cirrhotic patients with HCC BCLC stage D than in HCC patients with BCLC stage B than in HCC patients with BCLC stage A (19.91±2.40, 13.41±1.80 and 5.68±1.86 respectively). ROC curve was plotted to detect the potential application of miR-143 in the diagnosis of liver cirrhosis and HCC post HCV. Our results showed that miR-143 could serve as valuable biomarkers for HCV related cirrhosis and HCC.

Conclusion: Serum level of miR-143 is significantly higher in cirrhotic patients with early HCC than in cirrhotic patients without HCC which may suggest its role in hepatocarcinogenesis. Serum levels of miR-143 showed significant increase in HCV-related cirrhosis and HCC in comparison with healthy subjects with its high sensitivity and specificity in detecting HCC value as a potential biomarker for early diagnosis of HCV-related HCC.

esam_elzohery@yahoo.com