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Mitochondrial DNA Copy Number in Egyptian Patients with Hepatitis C Virus Related Hepatocellular Carcinoma

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Abstract : Introduction: Hepatitis C virus infection (HCV) constitutes a serious dilemma that has an impact on the health of millions of Egyptians. Hepatitis C virus related hepatocellular carcinoma (HCV-HCC) is a crucial consequence of HCV that represents the third cause of cancer-related deaths worldwide. Aim of the study: assess the use of mitochondrial DNA (mtDNA) content as a non-invasive molecular biomarker in hepatitis c virus related hepatocellular carcinoma (HCV-HCC). Methods: A total of 135 participants were enrolled in the study. Volunteers were assigned to one of three groups equally; a group of HCV related cirrhosis (HCV-cirrhosis), a group of HCV-HCC and a control group of age- and sex- matched healthy volunteers with no evidence of liver disease. mtDNA was determined using a quantitative real-time PCR technique. Results: mtDNA content was lowest in HCV-HCC cases. No statistically significant difference was observed between the group of HCV-cirrhosis and the control group as regards mtDNA level. HCC patients with multi-centric hepatic lesions had significantly lower mtDNA content. On using receiver operating characteristic curve analysis, a cutoff of 34 was assigned for mtDNA content to distinguish between HCV-HCC and HCV-cirrhosis patients who are not yet complicated by malignancy. Lower mtDNA was associated with greater HCC risk on using healthy controls, HCV-cirrhosis, or combining both groups as a reference group. Conclusions: mtDNA content might constitute a non-invasive molecular biomarker that reflects tumor burden in HCV-HCC cases and could be used as a predictor of HCC risk in patients of HCV-cirrhosis. In addition, the non significant difference of mtDNA level between HCV-cirrhosis patients and healthy controls could eliminate the grey zone created by the use of AFP in some cirrhotic patients.

Keywords : DNA copy number, HCC, HCV, mitochondrial
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