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A New Biomarker for Hepatocellular Damage: Plasma Cell-Free DNA

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ABSTRACT

Background: Accumulating evidence has suggested that cell-free DNA (cf-DNA) enters the circulation following cell apoptosis or necrosis. An increased level of cf-DNA fragments has been found in the blood of mice with drug-induced liver damage. We sought to determine the role of cf-DNA in hepatocellular damage. Methods: Plasma samples were collected from 204 patients with hepatitis. The patients were divided into three groups according to liver pathologic characteristics: with chronic hepatitis (CH) and compensated liver cirrhosis (LC) (the group 1); with decompensated liver cirrhosis (DLC) (the group 2); with liver failure (LF), acute hepatitis (AH) and hepatocellular carcinoma (HCC) (the group 3). The cf-DNA was extracted with the phenol/chloroform/isoamyl alcohol (PCI) method and the plasma cf-DNA was quantified using real-time polymerase chain reaction (rt-PCR) for β-globin. The cf-DNA copies were converted to log2 values for comparison. Results: Cf-DNA was detected in all the 3 groups. The group 3 had a significantly higher cf-DNA level than the other two groups (17.70 ± 1.79, P = 0.002). The level of plasma cf-DNA was correlated with the baseline aniline transaminase (ALT) and aspertate transaminase (AST) activities (P < 0.005). The cf-DNA concentration in patients with cirrhosis was correlated with the model of end-stage liver disease-Na (MELD-Na) score and the ALT and AST activities. Correlation of the cf-DNA level with laboratory parameters, such as bilirubin and international normalized ratio (INR), were found in patients with high cf-DNA levels (cf-DNA > 19.5), or with severe hepatocellular damage (ALT > 500 U/L). Conclusion: Plasma cell-free DNA may be a new promising, independent, non-invasive biomarker for hepatocellular damage.

KEYWORDS

Hepatocellular Damage; Cell-Free DNA

Cite this paper

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