Matrix metalloproteinase-9 gene polymorphism in hepatocellular carcinoma patients with hepatitis B and C viruses

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ABSTRACT. Hepatocellular carcinoma (HCC) is the fifth most common malignancy worldwide. In Egypt, the incidence of HCC has doubled over the last decade. Matrix metalloproteinase-9 (MMP-9) plays a key role in cancer invasion and metastasis by degrading the extracellular matrix and basement membrane barriers. A cytosine (C)/thymidine (T) single nucleotide polymorphism at position -1562 in the MMP-9 promoter is reported to influence the expression of the MMP-9 gene. The association between MMP-9 gene polymorphisms and HCC
patients with hepatitis C and B viruses (HCV and HBV) was examined in 91 patients with HCC and viral hepatitis (55 HCV and 36 HBV). The results were compared with those of 42 HCC patients without viral hepatitis and 60 healthy individuals with no liver infection. Polymorphisms of the MMP-9 gene were investigated by polymerase chain reaction amplification followed by restriction fragment length polymorphism analysis. The serum MMP-9 level was quantitatively determined using a human MMP-9 enzyme-linked immunosorbent assay, which showed that homozygosity of the MMP-9 promoter (TT) was more frequent in patients with HCC and chronic HCV or HBV infection when compared with the control group (49.1, 52.8, and 35.7%, respectively). In addition, we observed significant elevation of serum MMP-9 levels in all HCC groups compared to controls. It was concluded that patients with the MMP-9 TT genotype are at risk of developing HCC and HBV or HCV. People with significantly elevated serum levels of MMP-9 are at risk of developing HCC.

**Key words:** MMP-9 gene polymorphism; Viral hepatitis; Hepatocellular carcinoma