SUMMARY

This study was performed to evaluate plasma matrix metalloproteinase-9 (MMP-9) in chronic liver diseases and its role in early detection of HCC in comparison with AFP, PIIIP and ICAM-1.

This study was performed on 90 patients visiting the inpatient departments and the outpatient clinics in the National Liver Institute, Menoufiya University, suffering from various types of chronic hepatitis virus-induced liver diseases. These patients were classified into three groups; chronic hepatitis (CH), liver cirrhosis (LC) and hepatocellular carcinoma (HCC), there was another group (30 individuals) as an apparently healthy control group with normal liver function tests, normal ultrasonography and negative for HBsAg and anti-HCV antibody.

All patients included in this study were investigated diagnosed and classified according to full medical history, clinical examination, ultrasonography, liver biopsy and detection of viral markers, including HBsAg and anti-HCV antibody.

All patients and control groups were submitted to: estimation of serum AFP, serum PIIIP, plasma cICAM-1 and plasma MMP-9.

In the current study, the age and sex of the patients and control groups were nearly matched.

The liver function tests in the patient groups were highly significant in comparison with the control group (TB, DB, ALT, AST and ALP were highly significantly increased but TP and albumin were highly significantly decreased).

The liver function tests among the patients groups showed no significant changes except serum albumin which showed highly significant changes among the three groups and alkaline phosphatase which was highly significantly increased in HCC group in comparison with CH and LC groups.

Patients in this study were infected with HBV and/or HCV.

In the current study, the serum PIIIP levels in patient groups (CH, LC and HCC) were significantly higher than those in the normal control group.

When comparing the serum PIIIP levels among the patients groups it was found that serum PIIIP levels were

highly significantly increased in HCC group in comparison with CH and LC groups.

These results were similar to the results of AFP in this study, so the serum levels of PIIIP increased with the progress of the severity of the disease.

There was no correlation between serum PIIIP levels and age, serum liver function tests, serum FP, plasma cICAM-1 and plasma MMP-9 in the patients groups except in CH group there was positive correlation with ALP.

there was no correlation between serum PIIIP levels and number, size and grading of tumor in HCC group.

This study revealed that, plasma cICAM-1 levels were highly significantly increased in patient groups (CH, LC and HCC) in comparison with that of the control group, this was similar to the results of AFP in the present study which indicated that its level increased with increasing the severity of the disease.

Comparing the plasma levels of cICAM-1 among patients groups, it was found that its levels were highly significantly increased in LC and HCC groups in comparison with CH group. This was different from that of serum AFP. For this reason, cICAM-1 does not appear to be useful diagnostic

marker for HCC but it can be a useful marker for the severity of inflammatory chronic liver diseases.

There was no correlation between plasma levels of cICAM-1 and age, serum liver function tests, serum AFP, serum PIIIP and plasma MMP-9 levels in the patients groups except in CH group, there was a positive correlation with serum TP, and in HCC group, there was positive correlation with serum ALP and size of the tumour.

MMP-9 is a member of the MMP gene family and it is secreted by a wide range of cells. The enzyme has a wide range of substrate specificity against interstitial fibrillar collagens (collagen types III, IV and V).

In the present study, plasma MMP-9 levels in patients with CH and LC showed no significant difference compared with the normal controls which was different from that of serum AFP but in patients with HCC, plasma MMP-9 levels showed highly significantly increase in comparison with normal controls similar to that of serum AFP.

On comparing plasma levels of MMP-9 among the patients groups, it was found that there was highly significantly increase of plasma MMP-9 levels in HCC group in comparison with that of CH and LC groups, these results were similar to

that of serum AFP which indicated that, plasma MMP-9 is elevated with increase in hepatocellular damage and progress of chronic liver disease.

There were no correlations between plasma MMP-9 levels and age, liver function tests, serum AFP, serum PIIIP and plasma cICAM-1 levels except in HCC group, there were positive correlations between plasma MMP-9 levels and TB, DB, ALP and grading of the tumour.

The receiver operator characteristic curve (ROC curve) was made to determine the best cut off values for serum AFP, serum PIIIP, plasma cICAM-1 and plasma MMP-9 and to determine the most sensitive and most specific marker among them in early detection of HCC patients.

It was found that the best cut off values were 68 ng/ml for serum AFP, 25.8 μg/L for serum PIIIP, 905 ng/ml for plasma cICAM1 and 89.9 ng/ml for plasma MMP-9.

Serum AFP was the most sensitive marker followed by plasma MMP-9, plasma cICAM-1, then serum PIIIP respectively.

Serum AFP was the most specific marker followed by serum PIIIP, plasma cICAM-1 then plasma MMP-9.