Original Article

Collagenogenic invasion in the livers of viral hepatitis patients

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Abstract: Our report aimed to investigate the physiopathological patterns of liver lesions patients during hepatitis. After being diagnosed clinically as hepatopathy (n=9), the liver biopsy samples were prepared to paraffin-sections and further subjected to routine and immunohistochemical stains. Among these lesioned livers invaded by viruses, immunity-regulatory molecules, such as CD20, CD4 and CD8, were significantly expressed. In addition, antigens of the hepatitis B virus (HBsAg and HBcAg) were positively detected in non-dependent way of hepatitis intervention. Furthermore, the pro-fibrotic promotor of vimentin (Vim) was labelled immunologically in mesenchymal cells within virus-attacked livers. These observations provide the clinicopathologic evidences that there is a potential association between immunodeficiency and collagenation in hepatitis patients when liver injury development. It also manifests that regulation of intrahepatic immunologic response may inhibition of excessive collagen generation prior to further progressing to hepatofibrosis.

Keywords: Hepatitis, immunodeficiency, collagenation, vimentin

Introduction

Virus-induced liver injury (hepatitis) is characterized with inflammation stress in the liver. If without control, this pathological condition will exacerbate forward lethal cirrhosis over time [1, 2]. In viral hepatitis, the virus-infected hepatocytes can induce immune system to attack the liver, gradually causing inflammatory and dysfunction [3, 4]. Viral hepatitis is diagnosed commonly via clinical laboratory assaying before delivering medication prescription [5]. In fact, medical strategy to reduce hepatitis-induced liver impairments mainly implies in the chemotherapy for inhibiting viral replication [6, 7]. However, the endogenous collagen is predisposed to fibrils derived by immunologic damage [8]. Thus, unregulated collagenation in virus-invaded liver merits additionally clinical scenarios. In current report, we focus on clinical symptom and pathologic inspection of diagnosed hepatitis patients to discuss the linkage of hepatopathy-related immunodeficiency and collagen deposits.

Patients and methods

Our research was designed to screen the representative immunophenotypes in hepatitis patients. Definite diagnosis of hepatitis was subjected to peripheral blood testing. Subsequently, registered patients were punctured via biopsy and collected liver samples for further analysis. The liver specimens were processed with 10% formalin, followed by dehydrated and embedded within paraffin. Typical 5 μm-sections were stained with hematoxylin and eosin (HE) dyes for pathological assessment. Hepatic sections were immunostained for primary antibodies (1:200) at 4°C overnight and further coupled with secondary antibodies (1:1,500) for 1 h at room temperature. Antigen-antibody complex were coloured with 3, 3'-diaminobenzidine and counterstained with haematoxylin in nuclei.
Hepatovirus induces collagenation

Results

Diagnostic demographic features

Here 9 liver-lesioned patients were recruited following clinical diagnosis for infecting hepatitis B, in connection with average age 41 and sex contained 6 male and 3 female, and serological patterns of positively detected HBsAg/HBcAg and increased alanine aminotransferase.

Liver-sections displayed representative immunoreactive cells

In order to show the intrahepatic immunophenotypes, the immune-markers were used for trace the positive cells. The majority of viral hepatitis patients showed

<table>
<thead>
<tr>
<th>Cases</th>
<th>Age/Sex</th>
<th>HBsAg-Positive</th>
<th>HBCAg-Positive</th>
<th>CD20-Positive</th>
<th>CD4-Positive</th>
<th>CD8-Positive</th>
<th>Vim-Positive</th>
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immunopositivity for anti-CD20, CD4 and CD8, accompanied by detectable seropositivity for HbsAg (Table 1). More visibly, most of the liver-slices had necrosis and watery deformation, perportal inflammatory cell and lymphocyte infiltration, as evidenced in Figure 1.

Liver-sections labelled specific vimentin positive cells

To further characterize the collagenic distribution within virus-infected livers, vimentin-specific immuno-marker was stained on paraffin-embedded liver sections. Among these slices, more detectable immuno-positivity for anti-Vim showed around to liver tissue with immunoreactive for immune-markers in most hepatitis patients (Figure 1). More notably, Vim-positive cells also yielded in non-detected HBsAg liver (Table 1).

Discussion

In brief, these representative evidences elucidated that there were possible relevance of immunologic deficiency and collagenic production in hepatitis, even liver injury patients. Thus, these findings also indicate that hyper-immunity may induce attenuated scavenging capability of excess collagen generation, in which this outcome is a potential risk of developing fibrosis or cirrhosis over time. In clinical practice, these observations might contribute to the perspective guidance that draws attention to the medics for concerning early collagenogenic symptom when making prescription to combat hepatitis.

Given the limitation involved, further investigation with large sample in hepatitis patients needs to be performed in connection with the hypothesis stated in this report.

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Disclosure of conflict of interest

None.

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References