SERUM GLYCOPROTEINS IN THE LIVER DISEASES.
V. DESIALYLATED GLYCOPROTEINS IN CHRONIC HEPATITIS

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Summary

Serum desialylated glycoprotein level was tested for chronic hepatitic patients. The level was significantly elevated in patients with chronic aggressive hepatitis but not in chronic persistent hepatitis comparing to normal subjects. In chronic aggressive hepatitis, severe type (2B), serum desialylated glycoprotein levels were significantly enhanced but not in moderate type (2A) when compared to chronic persistent hepatitis. Sera taken serially from patients with chronic aggressive hepatitis, severe type (2B), demonstrated a slight correlation between circulating desialylated glycoprotein level and serum glutamic-pyruvic transaminase activity.

Key Words: Desialylated glycoproteins, alpha-1-acid glycoprotein, chronic hepatitis, SGPT, SGOT, alkaline phosphatase, bilirubin, rat liver cell membrane, chronic persistent hepatitis, chronic aggressive hepatitis.

Introduction

Glycoproteins are widely distributed in animal tissues and they constitute a major portion of the serum proteins1). These proteins are catabolized by the liver parenchymal cells following desialylation3).

Marshall and his colleagues measured the circulating desialylated glycoproteins (DGP) in patients with a variety of liver diseases by using an inhibition assay5,4). They determined elevated DGP levels in two infectious hepatitic patients.

More recently, we developed a competitive inhibition assay for the determining serum DGP5). By the method, an increased DGP level associating with serum glutamic pyruvic transaminase (SGPT) was observed in acute hepatitis6). In fulminant hepatitis it was increased in parallel with serum bilirubin level6).

The present study was undertaken to examine the serum DGP level in chronic hepatitis, and this report describes the usefulness of this procedure in the diagnosis and managements of chronic hepatitis.
Materials and Methods

The serum desialylated glycoprotein level was measured by the method described by the authors and it was expressed the ability of inhibition equivalent to desialylated α1-acid glycoprotein used as a standard. The mean value of serum desialylated glycoprotein in normal human adults was determined to be 3.2 ng/10μl with a standard deviation of 0.91.

Patients with chronic hepatitis were carefully followed in the Okayama University Hospital and Mitoyo General Hospital over an eight-week to one year period. The DGP level was determined at frequent intervals, and the following liver function tests were simultaneously performed: serum bilirubin, SGPT, SGOT, alkaline phosphatase, total protein and its fractions, cephalin flocculation, thymol turbidity, urinary urobilinogen and Indocyanine green clearance rate. The diagnosis of chronic hepatitis was based on the histological examination according to the criteria of DeGroote et al.

Eighty-seven sera from 33 patients with chronic hepatitis were subjected to the determination and the mean values calculated for each patients were used for analyses.

Results

Serum desialylated glycoproteins were measured in sera of 7 patients with chronic persistent hepatitis and the level had a mean value of 3.6±1.53 ng/10μl (Table 1). Fig. 1 depicts serial DGP alterations in a 28 year-old female who incurred chronic persistent hepatitis: the DGP level does not apparently changed in contrast to the abnormal SGPT.

Sixteen patients with chronic aggressive hepatitis, severe type (2B) were tested for the serum DGP. The level was statistically significantly elevated with a mean value of 7.33±4.30 ng/10μl compared to normal subjects (p<0.001) (Table 1). Fig. 2 shows the levels of SGPT and DGP in a 21 year-old male patient with chronic aggressive hepatitis, severe type (2B), in whom the DGP level had never returned to the normal range during the observation.

The remaining 10 patients with chronic aggressive hepatitis, moderate type (2A), showed a statistically significant alteration (p<0.05) compared to normal subjects, but of less magnitude than in severe type (2B). A typical time course of them is shown in Fig. 3.

In general, the serum DGP level in chronic hepatitis did not correlate to the other liver function tests mentioned in the methods.

Table 1. Circulating desialylated glycoproteins (DGP) in chronic hepatitis

<table>
<thead>
<tr>
<th>No. of cases</th>
<th>DGP, ng/10μl</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>20</td>
<td>3.24</td>
<td>0.91</td>
</tr>
<tr>
<td>Chronic persistent hepatitis</td>
<td>7</td>
<td>3.61</td>
<td>1.53</td>
</tr>
<tr>
<td>Chronic aggressive hepatitis, moderate (2A)</td>
<td>10</td>
<td>5.43</td>
<td>2.91</td>
</tr>
<tr>
<td>Chronic aggressive hepatitis, severe (2B)</td>
<td>16</td>
<td>7.33</td>
<td>4.30</td>
</tr>
</tbody>
</table>

Fig. 1. Time course of DGP and SGPT levels in a 28 year old female patients with chronic persistent hepatitis.